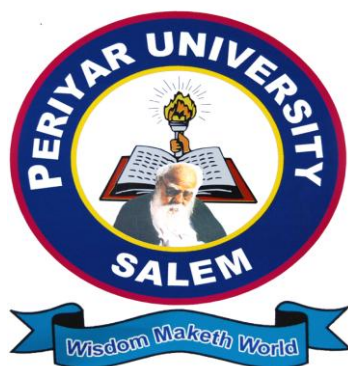


**PERIYAR UNIVERSITY**  
**PERIYAR PALKALAI NAGAR**  
**SALEM – 636 011**



**DEGREE OF BACHELOR OF  
SCIENCE  
CHOICE BASED CREDIT SYSTEM**

**SYLLABUS FOR B.Sc. COMPUTER SCIENCE**

**FOR THE STUDENTS ADMITTED FROM THE  
ACADEMIC YEAR 2012 – 2013 ONWARDS**

# PERIYAR UNIVERSITY, SALEM – 11

## REGULATIONS FOR B.Sc., (COMPUTER SCIENCE) DEGREE

### COURSE with Semester System

(Effective from the academic year 2012-2013)

## REGULATIONS

### 1. ELIGIBILITY FOR ADMISSION

A candidate who has passed in Higher Secondary Examination with Mathematics or Business Mathematics or Computer Science or Statistics (Academic stream or Vocational stream) as one of the subject under Higher Secondary Board of Examination, Tamilnadu as per norms set by the Government of Tamilnadu or an Examination accepted as equivalent thereto by the syndicate, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the **Bachelor of Computer Science degree examination** of this university after a course of study of three academic years.

### 2. DURATION OF THE COURSE

The course shall extend over a period of three years comprising of six semesters with two semesters in one academic year. There shall not be less than 90 working days for each semester. Examination shall be conducted at the end of every semester for the respective subjects.

### 3. COURSE OF STUDY

The course of study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time. The syllabus for various subjects shall be clearly demarcated into five viable UNITS in each paper/subject. Part -I, Part-II, Part – III and Part – IV subjects are as prescribed in the scheme of examination.

#### **4. Examinations**

The theory examination shall be three hours duration to each paper at the end of each semester. The candidate failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examination. The practical examinations for UG course should be conducted at the end of the ever semester.

##### **4.(a) Submission of record note books for practical examinations**

Candidates appearing for practical examinations should submit bonafide Record Note Books prescribed for practical examinations, otherwise the candidates will not be permitted to appear for the practical examinations. However, in genuine cases where the students, who could not submit the record note books, they may be permitted to appear for the practical examinations, provided the concerned Head of the department from the institution of the candidate certified that the candidate has performed the experiments prescribed for the course. For such candidates who do not submit Record Books, zero (0) marks will be awarded for record note books.

#### **5. Revision of Regulations and Curriculum**

The University may revise /amend/ change the Regulations and Scheme of Examinations, if found necessary.

##### **6(a). Passing Minimum – Theory**

The candidate shall be declared to have passed the examination if the candidate secure not less than 40 marks out of 100 (**CIA – 10 marks out of 25 and EA – 30 marks out of 75**) in the University examination in each theory paper.

##### **6(b). Passing Minimum – Practical**

The candidate shall be declared to have passed the examination if the candidate secure not less than 40 marks put together out of 100 (**CIA – 16 marks out of 40 and EA – 30 marks out of 60**) in the University examination in each practical paper.

## 7. Question Paper Pattern for B.Sc.(CS) /B.Sc.(IS) /BCA Courses

### 7.1(a). *THEORY - Question Paper Pattern [EA] (Total Marks: 75)*

#### **PART – A (10 x 2 = 20 Marks)**

(Answer ALL questions), (Two questions from each UNIT)

#### **PART – B (5 x 5 = 25 Marks)**

(Answer ALL questions) & (One question from each UNIT with Internal Choice)

#### **PART – C (3 x 10 = 30 Marks)**

(Answer ANY THREE questions) & (Open Choice – 3 out of 5 questions)

### 7.1(b). *THEORY - Internal Marks Distribution[CIA] (Total Marks: 25)*

- Attendance :5 Marks
- Assignment :5 Marks
- Internal Examinations :15 Marks

### 7.2(a). *PRACTICAL – Marks Distribution & Question paper Pattern*

**(Max. Marks: 100)**

**[External [EA]: 60 Marks & Internal [CIA]: 40 Marks]**

### *PRACTICAL - External Marks Distribution (Total Marks: 60)*

For each practical question the marks should be awarded as follows (**External**):

- i) Algorithm / Flowchart - 20%
- ii) Writing the program in the main answer book - 30%
- iii) Test and debug the program - 30%
- iv) Printing the correct output - 20%

(Marks may be proportionately reduced for the errors committed in each of the above)

### *PRACTICAL - Internal Marks Distribution (Total Marks: 40)*

- Record : 15 Marks
- Internal Practical examinations : 25 Marks

## PRACTICAL Question Paper Pattern

- **Practical Exam must be conducted at end every Semester**
- **Practical - I to Practical –VI has same Patten**
- **Student may select any two questions out of four questions.**

### **8. Commencement of this Regulation:**

These regulations shall take effect from the academic year 2012-13, i.e, for students who are to be admitted to the first year of the course during the academic year 2012-13 and thereafter.

### **Scheme of Examinations from the Academic Year 2012-2013**

#### Credit Distribution as per the University Norms.

SEMESTER	I	II	III	IV	V	VI	Total Credits
PART - I	3	3	3	3	-	-	12
PART - II	3	3	3	3	-	-	12
ALLIED	4	6	4	6	-	-	20
MAJOR	4	4	8	4	12	8	40
PRATICAL	4	4	4	4	4	4	24
ELECTIVE	-	-	-	-	5	10	15
SBEC	-	2	-	2	4	4	12
NMEC	-	-	2	2	-	-	4
EVS	-	2	-	-	-	-	2
VALUE EDU	2	-	-	-	-	-	2
Extn. Activity	-	-	-	-	-	1	1
<b>Cumulative Total Credits</b>	<b>20</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>25</b>	<b>27</b>	<b>144</b>

## SEMESTER – I

Sem	Part	Sub Code	Subject	Hrs.		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
I	I		Tamil - I	6	-	3	25	75	100
	II		English – I	6	-	3	25	75	100
	III		Digital Computer Fundamentals and Microprocessor	6	-	4	25	75	100
			Practical - I (Microprocessor)	-	4	4	40	60	100
			Allied I : Paper - I	6	-	4	25	75	100
		Value Education	2	-	2	25	75	100	
			<b>Total</b>	<b>26</b>	<b>4</b>	<b>20</b>	<b>165</b>	<b>435</b>	<b>600</b>

## SEMESTER – II

Sem	Part	Sub Code	Subject	Hrs.		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
II	I		Tamil - II	6	-	3	25	75	100
	II		English – II	6	-	3	25	75	100
	III		Programming in C	4	-	4	25	75	100
			Practical – II(Programming in C)		3	4	40	60	100
			Allied I : Paper - II	4	-	3	25	75	100
		Allied I : Paper - III	4	-	3	25	75	100	
		SBEC – I (Basics of Internet)	1	1	2	25	75	100	
		Env. Studies	1	-	2	25	75	100	
		<b>Total</b>	<b>26</b>	<b>4</b>	<b>24</b>	<b>215</b>	<b>585</b>	<b>800</b>	

## SEMESTER – III

Sem	Part	Sub Code	Subject	Hrs.		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
III	I		Tamil - III	6	-	3	25	75	100
	II		English – III	6	-	3	25	75	100
	III		Programming in C++	4	-	4	25	75	100

		Data Structures and Algorithms	4		4	25	75	100
		Practical - III (Data Structures using C++)	-	2	4	40	60	100
		Allied II: Paper – I	4	-	4	25	75	100
		Allied II: Practical Lab - I	-	2	-			
<b>IV</b>		Tamil/ Advanced Tamil (OR) Non –Major elective – I NMEC –I	2	-	2	25	75	100
		<b>Total</b>	<b>26</b>	<b>4</b>	<b>24</b>	<b>190</b>	<b>510</b>	<b>700</b>

#### SEMESTER – IV

Sem	Part	Sub Code	Subject	Hrs.		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
<b>IV</b>	<b>I</b>		Tamil - IV	6	-	3	25	75	100
	<b>II</b>		English – IV	6	-	3	25	75	100
	<b>III</b>		Programming in Java	4	-	4	25	75	100
			Practical - IV (Java)	-	3	4	40	60	100
			Allied II : Paper - II	5	-	4	25	75	100
		Allied II: Practical. Lab - I	-	2	2	40	60	100	
	<b>IV</b>		<b>SBEC – II (Exploring on Word )</b>	1	1	2	25	75	100
			Tamil/ Advanced Tamil (OR) Non –Major elective – I NMEC – II	2	-	2	25	75	100
		<b>Total</b>	<b>24</b>	<b>6</b>	<b>24</b>	<b>230</b>	<b>570</b>	<b>800</b>	

#### SEMESTER – V

Sem	Part	Sub Code	Subject	Hrs.		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
<b>V</b>	<b>III</b>		Visual Programming	5	-	4	25	75	100
			Operating Systems	5	-	4	25	75	100
			Software Engineering	5	-	4	25	75	100
			Elective – I	6	-	5	25	75	100

		Practical – V (VB)	-	5	4	40	60	100
	IV	<b>SBEC – III (MS Access)</b>	1	1	2	25	75	100
		<b>SBEC – IV (Soft Skills)</b>	2	-	2	25	75	100
		<b>Total</b>	<b>24</b>	<b>6</b>	<b>25</b>	<b>190</b>	<b>510</b>	<b>700</b>

### SEMESTER – VI

Sem	Part	Sub Code	Subject	Hrs.		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
VI	III		Relational Database Management Systems	5	-	4	25	75	100
			Web Designing	5	-	4	25	75	100
			Elective – II	6	-	5	25	75	100
			Elective – III	6	-	5	25	75	100
			Practical - VI (Web Designing)	-	4	4	40	60	100
			<b>SBEC –V (Excel &amp; PowerPoint)</b>	1	1	2	25	75	100
	IV		<b>SBEC –VI ( Flash)</b>	1	1	2	25	75	100
		V	Extn. Act.	-	-	1			
			<b>Total</b>	<b>24</b>	<b>6</b>	<b>27</b>	<b>190</b>	<b>510</b>	<b>700</b>

### ELECTIVE SUBJECTS

#### Elective – I

Sem.	Part	Subject Code	Subject
V	III		Computer Organization and Architecture
			Computer Networks
			Client/Server Technology

#### Elective – II

Sem.	Part	Subject Code	Subject
VI	III		PHP Scripting Language
			E-Commerce
			Software Project Management

#### Elective – III

Sem.	Part	Subject Code	Subject
VI	III		Data Mining and Ware housing
			Multimedia Systems
			Mobile Computing



Extra Disciplinary Subjects offered by the Department of Computer Science/Applications - Non Major Elective Course – (NMEC).

**The department can offer any one of the subjects to the other major subject students in each semester.**

**Semester III**

1. Fundamentals of Information Technology
2. Basics of Computers and Office Automation

**Semester IV**

1. Introduction to Object Oriented Programming Language C++
2. HTML and Web Design

**SBEC – Skill Based Elective Courses**

Part	Sem.	Sub. Code	Subject	Hrs.		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
IV	II		SBEC – 1 : Basics of Internet	1	1	2	25	75	100
	IV		SBEC – II : Exploring on Word	1	1	2	25	75	100
	V		SBEC – III : MS Access	1	1	2	25	75	100
	V		SBEC - IV : Soft Skills	2	-	2	25	75	100
	VI		SBEC – V : Excel & PowerPoint	1	1	2	25	75	100
	VI		SBEC-VI : Flash	1	1	2	25	75	100

**ALLIED PAPERS**

**I - YEAR (Allied – I: First Option)**

Part	Semester	Subject	Hrs.		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	I	Allied I : Paper – I: Algebra and Fourier series	6	-	4	25	75	100
	II	Allied I : Paper – II: Differential Equations and Laplace Transforms	4	-	3	25	75	100
	III	Allied I : Paper – III : Practical	4	-	3	40	60	100

### I -YEAR (Allied – I: Second Option)

Sem	Part	Semester	Subject	Hrs.		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
I	III	I	Allied I : Paper – I: Discrete Mathematics	6	-	4	25	75	100
II		II	Allied I : Paper – II: Numerical Methods	4	-	3	25	75	100
II		II	Allied I : Paper – III : Graph Theory	4	-	3	25	75	100

### I - Year / II-Year (Allied – I / II: Statistics - Third Option)

Part	Semester	Subject	Hrs.		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	I / III	Allied I : Paper – I: <b>Allied Statistics –I</b>	6	-	4	25	75	100
	II / IV	Allied I : Paper – II: <b>Allied Statistics –II</b>	4	-	3	25	75	100
	II / IV	Allied I : Paper – III : <b>Allied Statistics –III</b>	4	-	3	40	60	100

**II - YEAR (Allied – II: COMMERCE - FIRST Option)**

Part	SEMESTER	Subject	Hrs.		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	III	Allied II : Paper – I: Principles of Accounting	6	-	4	25	75	100
	IV	Allied II : Paper – II: Cost and Management Accounting	5	-	4	25	75	100
	III & IV	Allied II : Practical Lab -1: Allied Commerce Practical	2	-	2	40	60	100

**II - YEAR (Allied – II: ELECTRONICS - SECOND Option)**

Part	SEMESTER	Subject	Hrs.		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	III	Allied II : Paper – I: Applied Electronics-I	6	-	4	25	75	100
	IV	Allied II : Paper – II: Applied Electronics-II	5	-	4	25	75	100
	III & IV	Allied II : Practical Lab -1: Allied Electronics Lab –I	2	-	2	40	60	100

**II - YEAR (Allied – II: PHYSICS - Third Option)**

Part	SEMESTER	Subject	Hrs.		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	III	Allied II : Paper – I: Allied Physics – I	6	-	4	25	75	100
	IV	Allied II : Paper – II: Allied physics – II	5	-	4	25	75	100
	III & IV	Allied II : Practical Lab -1 Allied Physics Practical	2	-	2	40	60	100

**Non Major Elective Course – (NMEC)**  
**Extra Disciplinary Subjects offered by the Department of Computer  
 Science/Applications**

The department can offer any one of the subjects to the other major subject students in each semester.

Part	Sem.	Sub. Code	Subject	Lect. Hrs	Credit	Marks		
						CIA	EA	Total
IV	III		<b>NMEC I:</b> Fundamentals of Information Technology	2	2	25	75	100
			<b>NMEC I:</b> Basics of Computers and Office Automation	2	2	25	75	100
	IV		<b>NMEC II:</b> Introduction to Object Oriented Programming Language C++	2	2	25	75	100
			<b>NMEC II:</b> HTML and Web Design	2	2	25	75	100

<b>2012-13 Onwards</b>	<b>DIGITAL COMPUTER FUNDAMENTALS AND MICROPROCESSOR</b>	<b>B.Sc., Computer Science</b>
<b>I Semester</b>		<b>Core: Theory</b>
		<b>Credit: 4</b>

### **UNIT – I**

Introduction: Application of Computer - Different types of Computer systems - Basic components of Digital Computer System - Programming Languages; Number Systems.

### **UNIT – II**

Boolean Algebra and Gate Networks: Fundamentals concepts of Boolean Algebra – Logical Multiplication AND Gates, OR Gates, and Inverters – Evaluation of logical Expressions – Basic Law of Boolean Algebra – Simplification of expressions – De Morgan’s theorems – Basic Duality of Boolean Algebra - Derivation of a Boolean Expression.

### **UNIT - III**

Interconnecting Gates – Sum of products (SOP) and Products of sums (POS) – Derivation of products of sums expressions – Derivation of three Input variable expression – NAND gates and NOR gates - The Map method for simplifying expressions – Sub cube and covering – product of sums expressions – Don’t cares.

### **UNIT – IV**

Microprocessors, Microcomputers and Assembly Language: Microprocessors - Microprocessor instruction set and Computer Languages-From large computers to single chip Microcontrollers; Microprocessor Architecture and Microcomputer systems: Microprocessor Architecture and its operations – Memory – I/O devices; 8085 Microprocessor Architecture and Interfacing: The 8085 MPU – Examples of a 8085 based Microcomputer – Memory interfacing.

## **UNIT –V**

Programming the 8085: Introduction to 8085 Instructions ; Code conversion: BCD to Binary conversion – Binary to BCD conversion – BCD to seven segment LED code conversion – Binary to ASCII and ASCII to binary code conversion – BCD addition – BCD subtraction.

### **BOOKS FOR STUDY**

- 1."Digital Computer Fundamentals". Thomas C.Bartee, 6<sup>th</sup> Edition T.M.H Publisher, New Delhi, 1991.(UNIT I, II & III)
- 2."Microprocessor Architecture Programming and Application with the 8085". Ramesh Gaonkar, 5<sup>th</sup> Edition. (UNIT IV & V)

### **Reference Book:**

1. "Understanding Computers- Today and Tomorrow", Deborah Morley, Charles S. Parker, 11<sup>th</sup> Edition, Thomson Course Technology, 2007
2. "8085 Microprocessor Programming and Interfacing", N.K.Srinath, PHI

<b>2012-13 Onwards</b>	<b>PRACTICAL - I (MICROPROCESSOR )</b>	<b>B.Sc., Computer Science</b>
<b>I Semesters</b>		<b>Core: Practical -I</b>
		<b>Credit: 4</b>

### **LIST OF MICROPROCESSOR PRACTICALS**

Study of Intel 8085 Microprocessors performing simple exercises:

1. Perform 8-bit addition using 8085 Microprocessor.
2. Perform 8-bit subtraction using 8085 Microprocessor.
3. Perform 8 bit Multiplication using 8085 Microprocessor.
4. Perform 8 bit Division using 8085 Microprocessor.
5. Arranging the given numbers in Ascending Order.
6. Arranging the given N numbers in Descending Order.
7. Picking up the Largest Number in the given set.
8. Picking up the Smallest Number in the given set.
9. HEX number to Decimal number Conversion.

<b>Decimal Number to Hex Number Conversion.2012-13 Onwards</b>	<b>PROGRAMMING IN C</b>	<b>B.Sc., Computer Science</b>
<b>II Semester</b>		<b>Core: Theory</b>
		<b>Credit: 4</b>

### **UNIT– I**

Overview of C: History of C – Importance of C – Basic structure of C programs. Constants, variables and data types: Character set – C Tokens – Keywords and identifiers – Constants – Variables – Declaration of storage classes – Assigning values to variables- Defining symbolic constants. Operators and expression – Evaluation of expressions – Precedence of arithmetic operators – Type conversions in expressions – Operator precedence and associativity – Mathematical functions. Managing input and output operations: Reading and writing a character – Formatted input and output.

### **UNIT– II**

Decision making and branching: Simple IF, IF-ELSE, Nesting of IF-ELSE, ELSE-IF ladder, Switch statements – GOTO statements. Decision making and looping: WHILE statement – DO statement – FOR statement – Jumps in loops. Arrays: Definition & Declaration – One dimensional – Two dimensional – Multi dimensional arrays - Dynamic arrays.

### **UNIT – III**

Character arrays and strings: Introduction – Declaring and initializing string variables – Reading strings from terminal – Writing strings to screen – String handling functions – Table of strings. User – Defined functions: Introduction – Need for user – Defined function – A Multi- function program – Elements of user – Defined function – Definition of functions – Return values and their types – Function calls – Function declaration – All category of functions – Nesting of functions – Recursion – Passing arrays to functions – Passing strings to function.



## **UNIT – IV**

Structures and Unions: Introduction – Defining a structure – Declaring structure variables – Accessing structure members – Structure initialization – Copying and comparing structure variables – Arrays of structures – Arrays within structures – Structures within structures – Structures and functions – Unions – Size of structures – Bit fields.

Pointers: Introduction – Understanding pointers – Accessing the address of a variable – Initializing of pointer variables. Chain of pointers – Pointer expressions – Pointers and arrays – Pointers and character strings – Arrays of pointers – Pointers as function arguments – Functions returning pointers – Pointers to functions – Pointer and structures.

## **UNIT – V**

File Management: Introduction – Defining and opening a file – Closing a file – Input/Output operation on files – Error handling during I/O operations – Random access files – Command line arguments.

## **BOOK FOR STUDY**

Programming in ANSI C, E. Balgurusamy Tata McGraw Hill, New Delhi, 5<sup>th</sup> Edition.

## **BOOKS FOR REFERENCE**

1. “C: The complete Reference “, Herbert Schildt, Mc Graw Hill, New Delhi, 4<sup>th</sup> Edition
2. PROGRAMMING IN C, B.L.JUNEJA, Cengage Learning India

<b>2012-13 Onwards</b>	<b>PRACTICAL – II (C)</b>	<b>B.Sc., Computer Science</b>
<b>II Semesters</b>		<b>Core: Practical –II</b>
		<b>Credit: 4</b>

### **C PROGRAMMING LIST**

1. Write a program to find the largest number and smaller number by using if statement
2. Write a program to convert the decimal to binary conversion by using while statement.
3. Write a program to count the positive, negative & zero numbers.
4. Write a program to check whether a given number is a prime or not.
5. Write a program to display the Fibonacci series.
6. Write a program to concatenate two strings without using string library function.
7. Write a program to count the number of vowels, consonants, and digits in a line of Text.
8. Write a program to reverse a String.
9. Write a program to design the calculator functions as (i) Addition (ii) Subtraction & (iii) Multiplication function.
10. Write a program to find the factorial of a number using recursion.
11. Write a program for ascending order of given N Numbers.
12. Write a program to separate odd and even numbers using file.

<b>2012-13 Onwards</b>	<b>PROGRAMMING IN C++</b>	<b>B.Sc., Computer Science</b>
<b>III Semester</b>		<b>Core: Theory</b>
		<b>Credit: 4</b>

### **UNIT – I**

Object-Oriented Programming: Principles – Benefits of OOP – Application of OOP – Tokens, Expression and Control Structures: Tokens – Keywords – Identifiers and Constants – Data types – Constants – Variables – Operators – Manipulators – Expressions – Control Structure.

### **UNIT – II**

Functions – Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – const Arguments – Function Overloading – Friend and Virtual Functions, Classes and Objects – Class – Member Functions – Arrays with in a Class – Memory Allocation for Objects – Static data members – Static member functions – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects – const Member Functions – Pointers to Members, Constructors and Destructors.

### **UNIT – III**

Operator Overloading and Type Conversions, Inheritance: Extending Classes – Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes, Pointers, Virtual Functions and Polymorphism: Pointers – Pointers to Objects –this Pointer – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions

### **UNIT – IV**

Managing I/O Operations: C++ Streams – C++ Stream Classes – Unformatted I/O and Formatted I/O Operations – Managing Output with Manipulators, Working with Files: Classes

for File Stream Operations – Opening and Closing a File – Detecting end-of-file – File Pointers and Their Manipulators – Sequential I/O Operations – Updating a File – Error Handling during File Operations – Command Line Arguments

#### **UNIT – V:**

Templates: Class Templates – Class Templates with Multiple Parameters – Function Templates – Function Templates with Multiple Parameters – Overloading of Template Functions – Member Function Templates – Non-Type Template Arguments, Exception Handling: Basics - Exception Handling Mechanism – Throwing Mechanism – Catching Mechanism – Rethrowing an Exception – Specifying Exceptions

#### **BOOK FOR STUDY**

“Object Oriented Programming with C++”, 5<sup>th</sup> Edition, E.Balagurusamy, Tate McGraw Hill Pub. Ltd., New Delhi.

#### **BOOKS FOR REFERENCE**

1. “Object Oriented programming with C++”, M. T. Somashekara, Prentice Hall of India Learning Limited, New Delhi.
2. “Programming with C++” John Hubbard, Mc Graw Hill, New Delhi, 3<sup>th</sup> Edition
3. A Structured Approach Using C++, 2<sup>nd</sup> e, Behrouz A.Forouzan, Cengage Learning

2012-13 Onwards	DATA STRUCTURES AND ALGORITHMS	B.Sc., Computer Science
III Semester		Core: Theory
		Credit: 4

### UNIT -I

**Algorithms (Analysis and design):** Problem solving – Procedure – Top-Down and Bottom-up approaches to algorithm design – Use of algorithms in problem solving: Developing an algorithm – Characteristics of algorithmic language - Design of algorithms – Implementation of algorithm – Verification of algorithm – Efficiency analysis of algorithms: Space, Time complexity, and Frequency count – Simple algorithms; **Data Representation:** Abstract data type (ADT) – **Fundamental and derived data types:** Declaration – Representation – Primitive data structures – Recursion.

### UNIT- II

**Arrays:** Definition – One dimensional array – Memory allocation, Operations, Application. Multidimensional Arrays: Two dimensional Arrays – Sparse matrices – Three dimensional and n-dimensional Arrays – Pointer Arrays; **Stacks:** Introduction – Definition – Representation of stacks – Operations on stacks – **Applications of stack:** Evaluation of Arithmetic Expression- Implementation of Recursion- Factorial Calculation

### UNIT -III

**Queues:** Introduction – Definition – Representation of Queues – using Arrays, Linked list; **Various Queue structures:** Circular Queue – De-queue – Priority Queue – Applications of Queues

**Linked List:** Definition; **Single Linked List:** Representation, Operations; **Circular Linked List;** **Double Linked List:** Operations; **Circular Double Linked List:** Operations.

#### **UNIT- IV**

**Trees:** Concepts – Representation of Binary tree – Operations on Binary Tree – Types of Binary Trees; **Graphs:** Introduction – Graph terminologies – Representation of Graphs – Operations on Graphs – Application of Graph Structures.

#### **UNIT- V**

**Searching and Sorting:** Searching – Sequential and Binary Search – Indexed Search – Hashing Schemes; **Sorting:** Selection sort – Bubble sort – Quick sort – Merge sort – Radix sort –Heap sort

#### **BOOKS FOR STUDY:**

1. “Classic Data Structures”, D. Samanta, PHI Learning , New Delhi 2011
2. “Data Structure made simple”, Sathish Jain, Shashi Singh, BPB Publications, New Delhi 2006

#### **BOOK FOR REFERENCE**

1. Magnifying Data Structures, Aprita Gopal , First Edition , PHI Learning, New Delhi
2. Data Structures in C, Horowitz, Sahni, Anderson-Freed, Universities Press

<b>2012-13 Onwards</b>	<b>PRACTICAL - III (DATA STRUCTURE USING C++)</b>	<b>B.Sc., Computer Science</b>
<b>III Semesters</b>		<b>Core: Practical-II</b>
		<b>Credit: 4</b>

**C++ PROGRAMMING LIST:**

1. Implement Push and Pop Operations of a Stack using Array
2. Implement Add and Delete Operations on Queue using Pointer
3. Write a Program to Convert an Infix Expression to Postfix Expression using Arrays.
4. Write a Program to Add Two Polynomials using Pointers.
5. Perform Tree Traversals for a Binary Tree using Recursion.
6. Write a program to perform Binary Search.
7. Sort the given list of numbers using Heap Sort.
8. Sort the given list of numbers using Quick Sort

<b>2012-13 Onwards</b>	<b>PROGRAMMING IN JAVA</b>	<b>B.Sc., Computer Science</b>
<b>IV Semester</b>		<b>Core: Theory</b>
		<b>Credit: 4</b>

### **UNIT – I**

**An overview of Java:** Object oriented programming – Java features – Java environment - Data types, variables and arrays. Operators- Expressions - Control Statements: Branching statements – Iteration statements – Jump statements – Sample java program.

### **UNIT – II**

Classes – Objects – Methods – Constructors – The this keyword – finalize () method – Overloading methods – Returning objects – Recursion – Static – Final – Nested inner classes – Command line arguments – Inheritance.

### **UNIT – III**

**Packages and Interfaces:** Packages – Access protection – Importing packages – Interfaces – Exception handling: Fundamentals – Exception types – Try and catch – Multiple catch – Nested try – throw – throws – finally – Build in exception.

### **UNIT – IV**

**Multithread programming:** Thread model –Life cycle of thread – Creating thread – Multiple threads – Thread priorities – Synchronization – Inter thread Communication – Suspending, Resuming and Stopping threads – I/O Applets, and other topics.



## **UNIT – V**

**The Applet Class:** Basics – Building applet code – Applet life cycle – Creating an executable applet – Designing a web page – Running the applet – Getting input from the user – Graphics programming: The graphic class – Lines and rectangles – Circles and ellipses – Using control loops in applets – Drawing bar charts.

### **BOOK FOR STUDY**

Programming with Java, 4<sup>th</sup> Edition, E. Balagurusamy, Tata McGraw Hill Pub. Ltd., New Delhi.

### **BOOKS FOR REFERENCE**

“The Complete Reference” Java2, 3<sup>rd</sup> Edition, Patrick Naughton, Herbert Schildt, Tata McGraw Hill Pub. Ltd., New Delhi.

<b>2012-13 Onwards</b>	<b>PRACTICAL - IV (JAVA)</b>	<b>B.Sc., Computer Science</b>
<b>IV Semesters</b>		<b>Core: Practical-IV</b>
		<b>Credit: 4</b>

### **JAVA LIST OF PROGRAMMS**

1. Write a Program to create an account in a Bank and Deposit Rs.20,000 with a minimum Balance of Rs.500. Use switch case statement for Deposit, Withdrawal and for Balance enquiry.
2. Write a program to find the area of the square, rectangle and triangle using the method of overloading.
3. Write a program to display the book title, price and author name using the method of overriding.
4. Implement of the concept of multiple inheritances to develop pay slip and design a package
5. Write a program to illustrate the use of multithreads.
6. Create a try block that is likely to generate three types of exception and then incorporate necessary catch blocks to catch and handle them appropriately
7. Write a program to copy characters from one file to another file.
8. Develop a java applet, which shows your name and address within a window frame.

<b>2012-13 Onwards</b>	<b>VISUAL PROGRAMMING</b>	<b>B.Sc., Computer Science</b>
<b>V Semester</b>		<b>Core: Theory</b>
		<b>Credit: 4</b>

**UNIT – I**

Welcome to Visual Basic – Creating an Application – IDE Forms and Controls – Variables in Visual Basic.

**UNIT – II**

Writing Code in Visual Basic – Working with File – Menus.

**UNIT – III**

Multiple Document Interface Applications – Debugging Tips – The Common Dialog Control.

**UNIT – IV**

Introduction to Database – Working with the Data Control – Data Access Objects.

**UNIT – V**

ActiveX Data Objects – Crystal and Data Report – Active X.

**BOOK FOR STUDY:**

Programming with Visual Basic 6.0, Mohammed Azam, Vikas Publishing House Pvt. Ltd., Chennai.

2012-13 Onwards	OPERATING SYSTEMS	B.Sc., Computer Science
V Semester		Core: Theory
		Credit: 4

### UNIT – I

Introduction - OS goals and functions – History of operating system- Different kinds of operating system- Computer hardware review – Operation system concept- System calls- Operating system structure.

### UNIT – II

**Processes and Threads:** Processes – threads – thread model and usage – inter process communication; **Deadlocks:** Resources- introduction to deadlocks – deadlock detection and recovery – deadlocks avoidance – deadlock prevention.

### UNIT – III

**Memory management:** Basis memory management – virtual memory – page replacement algorithms; **Input/Output:** principles of I/O hardware - principles of I/O software.

### UNIT – IV

**Files systems:** Files – directories - files systems implementation; **Multiple processor system:** multiprocessors – multi computers - distributed systems.

### UNIT – V

LINUX: An introduction to Linux- Getting started in Linux-Managing Linux Files and Folders.

#### BOOK FOR STUDY:

1. “Modern Operating Systems”, Second Edition, Andrew S. Tanenbaum, PHI private Limited, New Delhi, 2008
2. “Linux Learning the Essentials”,K.L.James, PHI.

#### BOOK FOR REFERENCE:

1. “Operating Systems – Internals & Design Principles” William Stallings. Prentice – Hall of India P.Ltd, New Delhi – 110001. 5th Edition.

2012-13 Onwards	SOFTWARE ENGINEERING	B.Sc., Computer Science
V Semester		Core: Theory
		Credit: 4

### UNIT – I

Introduction – Software Engineering Discipline – Evolution and Impact – Programs Vs Software Products – Emergence of Software Engineering – Changes in Software Development Practices – Computer Systems Engineering.

**Software Life Cycle Models:** Use of a Life Cycle Models – Classical Waterfall Model – Iterative Waterfall Model – Prototyping Model – Evolutionary Model – Spiral Model.

**Software Project Management:** Responsibilities of a Software Project Manager – Project Planning – Metrics for Project Size Estimation – Project Estimation Techniques –Risk Management – Software Configuration Management.

### UNIT – II

**Requirements Analysis and Specification:** Requirements Gathering and Analysis –Software Requirements Specification (SRS) – Formal System Development Techniques; **Software Design:** Characteristics of a Good Software Design – Cohesion and Coupling –Neat Arrangement – Software Design Approaches.

### UNIT – III

**Function-Oriented Software Design:** Overview of SA/SD Methodology – Structured Analysis – Data Flow Diagrams (DFDs) – Structured Design - Detailed Design – Design Review.

**Object Modeling Using UML:** Overview of Object-Oriented Concepts – UML – UML Diagrams – Use Case Model – Class Diagrams – Interaction Diagrams – Activity Diagrams – State Chart Diagram.

## **UNIT – IV**

**User Interface Design:** Characteristics of a Good User Interface – Basic Concepts – Types of User Interfaces – Component-Based GUI Development; **Coding and Testing:** Coding – Testing – UNIT Testing – Black-Box Testing – White-Box Testing – Debugging –Integration Testing – System Testing.

## **UNIT – V**

**Software Reliability and Quality Management:** Software Reliability – Statistical Testing – Software Quality – Software Quality Management System – ISO 9000.

**Computer Aided Software Engineering:** CASE Environment – CASE support in Software Life Cycle – Characteristics of CASE Tools –Architecture of a CASE Environment.

**Software Maintenance:** Characteristics of Software Maintenance – Software Reverse Engineering – Software Maintenance Process Models – Estimation of Maintenance Cost;

**Software Reuse:** Issues in any Reuse Program – Reuse Approach.

## **BOOK FOR STUDY**

Fundamentals of Software Engineering - RAJIB MALL, Prentice Hall of India Private Limited, 2008.

## **BOOK FOR REFERENCE**

SOFTWARE ENGINEERING CONCEPTS – Richard Fairley, TMH.

<b>2012-13 Onwards</b>	<b>Practical - V (VB)</b>	<b>B.Sc., Computer Science</b>
<b>V Semester</b>		<b>Core: Practical-V</b>
		<b>Credit: 4</b>

### **Visual Programming Lab List**

1. Develop a VB Project to Insert a Record in MS-ACCESS database using ADO.
2. Develop a VB Project to modify a record in MS-ACCESS database using ADO.
3. Construction of an Arithmetic Calculator (Simple)
4. Personal Information System (Using Tables)
5. Railways Reservation System (Using Tables)
6. Library Information System (Using Tables).

<b>2012-13 Onwards</b>	<b>Relational Database Management Systems</b>	<b>B.Sc., Computer Science</b>
<b>VI Semester</b>		<b>Core: Theory</b>
		<b>Credit: 4</b>

### **UNIT – I**

**Introduction:** Database System Applications – DBMS Vs. File System - View of Data –Data Model - Database Languages – Database users and Administrators - Transaction Management – Database System Structure – Application Architecture; **Data Models:** Basic Concepts – Constraint- Keys- ER Diagram – Weak Entity – Extended ER Features - Design of an ER Schema – UML; **Relational Model:** Structure of Relational Databases – Relational Algebra – Views.

### **UNIT – II**

**SQL:** Background – Basic Structure – Set Operation – Aggregate Function – Null Values – Nested Sub Queries – Views – Modification of the Database – Data Definition Language – Embedded SQL – Dynamic SQL.

### **UNIT-III**

Advance SQL : Integrity and Security: Domain – Constraint – Referential Integrity – assertions – Triggers – Security and Authorization – Authorization in SQL – Encryption and Authentication.

### **UNIT – IV**

**Relational Database Design:** First Normal Form - Pitfalls in Relational Database Design – Functional Dependencies (Second Normal Form) – Boyce-Codd Normal Form - Third Normal Form – Fourth Normal Form – Overall Database Design Process.



## **UNIT-V**

**Object Oriented Databases:** Need for Complex Data Types – Object Oriented Data Model – Object Oriented Language; **Object Relational Database:** Nested Relations – Complex Type – Query with Complex Type – Object Oriented Vs. Object Relational.

## **BOOK FOR STUDY**

“Database System Concepts”, Abraham Silberschatz, Henry F.Korth, S.Sudarshan, TMH 4th Edition.

<b>2012-13 Onwards</b>	<b>WEB DESIGNING</b>	<b>B.Sc., Computer Science</b>
<b>VI Semester</b>		<b>Core: Theory</b>
		<b>Credit: 4</b>

### **UNIT – I**

Getting Started with HTML: Editing and Viewing HTML Files – Setting Up the Document Structure – Formatting Text by Using Tags – Using Lists and Backgrounds – Creating Hyperlinks and Anchors,

### **UNIT – II**

Style Sheet and Graphics: Introduction to style sheet – Formatting Text by using Style Sheets- Formatting Paragraphs by using Style Sheets – Display Graphics.

### **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.

### BOOKS FOR STUDY:

1. HTML 5 Step by Step, Faithe Wempen, Prentice Hall of India Private Limited, New Delhi
2. WEB TECHNOLOGIES TCP/IP to Internet Applications Architectures – Achyut S Godbole & Atul Kahate, 2007 ,TMH.

<b>2012-13 Onwards</b>	<b>Practical - VI Web Designing</b>	<b>B.Sc., Computer Science</b>
<b>VI Semester</b>		<b>Core: Practical - VI</b>
		<b>Credit: 4</b>

### WEB DESIGNING Practical Programming List

1. Write HTML code to develop a web page for giving details of your name, age, address. It contains the different background and foreground color, with different attribute of Font tags like italic, bold, underline etc. and give suitable heading style.
2. Write HTML code to create a WebPages that contains an Image at its left hand side of the page when user clicks on the image; it should open another web page that displays the details of that image.
3. Create a web Page using HREF tag having the attribute ALINK, VLINK etc.

4. Create a web page, when user clicks on the link it should go to the bottom of the page.
5. Write a HTML code to create a web page of pink color and display moving message in red color.
6. Create a web page, showing an ordered list of name of your five friends and unordered list of any five your hobbies.
7. Create a HTML document containing a nested list showing the content page of any book.
8. Write a HTML program to reload the page which contains an image that should reload automatically for every 5 seconds.
9. Create a html program that import an External Cascading Style Sheet (CSS) where as the style for the html program is defined in CSS file.

10. Create the following table in HTML with Dummy Data

Name of the train	Place	Destination	Train No.	Time		Fare
				Arrival	Departure	

11. Create a web page which should divide a page into two equal frames & 3 Frames

Frame - 1	Frame - 2
-----------	-----------

Frame - 1	Frame - 3
	Frame - 4

12. Design a form using all input types.

13. Create a simple form for accepting – Name, Register No. and use Submit Button.

<b>2012-13 Onwards</b>	<b>Elective - I COMPUTER NETWORKS</b>	<b>B.Sc., Computer Science</b>
<b>V Semester</b>		<b>Elective- I : Theory</b>
		<b>Credit: 5</b>

### **UNIT – I**

**Introduction:** Uses of Computer Networks - Network Hardware – LAN, MAN and WAN- Network Software - Reference Models- Example Networks.

### **UNIT – II**

**Physical Layer:** The Theoretical Basis For Data Communication - Guided Transmission media - Wireless Transmission - Communication Satellites- Public Switched Telephone Network- The Mobile Telephone System

### **UNIT – III**

**Data Link Layer:** Data Link Layer Design Issues - Error Detection and Correction – Elementary data link protocols - Sliding Window Protocols – Example Data Link Protocols.

### **UNIT – IV**

**Network Layer:** Network Layer Design Issues- Routing Algorithms-Congestion Control Algorithms- Quality of Service –Internetworking. **Transport Layer:** Transport Services – Elements of transport protocols – Performance issues.

### **UNIT – V**

**Application layers:** Domain name system – Electric mail – The World Wide Web.

**Network security:** Cryptography- Symmetric-Key algorithms- Public-Key algorithms – Digital signature.

### **BOOK FOR STUDY**

“Computer Networks” Andrew S.Tanenbaum , David J.Wetherall, Fifth edition,  
Pearson Education , 2011

<b>2012-13 Onwards</b>	<b>Elective – I CLIENT/SERVER TECHNOLOGY</b>	<b>B.Sc., Computer Science</b>
<b>V Semester</b>		<b>Elective – I: Theory</b>
		<b>Credit: 5</b>

### **UNIT-I**

Client/Server Computing – Advantages of Client / Server Computing – Technology Revolution – Connectivity – Ways to improve Performance – How to reduce network Traffic

### **UNIT-II**

**Components of Client/Server Applications – The Client:** Role of a Client – Client Services – Request for Service. **Components of Client/Server Applications – The Server:** The Role of a Server – Server Functionality in Detail – The Network Operating System – What are the Available Platforms – The Server Operating system.

### **UNIT-III**

**Components of Client/Server Applications – Connectivity:** Open System Interconnect – Communications Interface Technology – Interprocess communication – WAN Technologies.

### **UNIT-IV**

**Components of Client/Server Applications–Software:** Factors Driving demand for application software development – Rising Technology Staff costs – Need to improve Technology – Need for Common Interface across Platforms – Client/Server System Development Methodology. **Components of Client/Server Applications–Hardware:** Hardware/Network Acquisition – PC-Level Processing Units – Machintosh, notebooks, Pen – UNIX Workstation – x-terminals – Disk, Tape, Optical Disks, NIC and UPS.

### **UNIT-V**

**Components of Client/Server applications–Service and Support:** System Administration. **The Future of Client/Server Computing:** Enabling Technologies – Transformational Systems.

### **BOOK FOR STUDY**

**CLIENT/SERVER COMPUTING – Patrick Smith, Steve Guenferich , 2nd edition,**  
Prentice Hall of India Private Limited, New Delhi

<b>2012-13 Onwards</b>	<b>Elective – I</b> <b>COMPUTER SYSTEM</b> <b>ARCHITECTURE</b>	<b>B.Sc., Computer Science</b>
<b>V Semester</b>		<b>Elective – I: Theory</b>
		<b>Credit: 5</b>

#### **UNIT – I**

**Digital Logic Circuits:** Digital Computers-Logic Gates-Boolean Algebra-Map Simplification-Combinational Circuits-Flip-Flops-Sequential Circuits-Integrated Circuits-Memory UNIT-Data Types-Complements.

#### **UNIT – II**

**Basic Computer and Organization Design:** Instruction Codes- Registers-Instructions-Timing and Control-Instruction Cycle-Memory Reference Instructions-Input Output and Interrupt.

#### **UNIT III**

**Programming the Basic Computer:** Machine Language-Assembly Language-The Assembler-Program Loops-Programming Arithmetic And Logic Operations-Subroutines-Control Memory-Address Sequencing.

#### **UNIT-IV**

**Central Processing UNIT:** Stack Organization-Instruction Format-Addressing Modes-Data Transfer and Manipulation-Program Control-Reduce Instruction Set Computer (RISC).

#### **UNIT-V**

**Pipelining and Vector Processing:** Parallel Processing-Pipelining-Arithmetic Pipeline-Instruction Pipeline-RISC Pipeline-Vector Processing-Array Processors.

#### **BOOK FOR STUDY:**

“COMPUTER SYSTEM ARCHITECTURE”, M. Morris Mano, Prentice Hall of India Private Limited, New Delhi, 1998. 3<sup>rd</sup> Edition.

<b>2012-13 Onwards</b>	<b>Elective – II</b> PHP Scripting Language	<b>B.Sc., Computer Science</b>
<b>VI Semester</b>		<b>Elective – II: Theory</b>
		<b>Credit: 5</b>

### **UNIT – I**

Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

### **UNIT – II**

Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

### **UNIT – III**

Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times.

### **UNIT – IV**

Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files-Writing Files-Processing Directories.



## **UNIT – V**

Working with Database and SQL : Introducing Database and SQL- Using MySQL-Adding and modifying Data-Handling Errors – Using SQLite Extension and PDO Extension. Introduction XML—Simple XML and DOM Extension.

### **BOOK FOR STUDY**

“PHP A Beginner’s Guide “, VIKRAM VASWANI, Tata McGraw-Hill

### **BOOKS FOR REFERENCE**

1. The PHP Complete Reference – Steven Holzner – Tata McGraw-Hill Edition.
2. Spring into PHP5 – Steven Holzer, Tata McCraw Hill Edition

<b>2012-13 Onwards</b>	<b>Elective – II E-COMMERCE</b>	<b>B.Sc., Computer Science</b>
<b>VI Semester</b>		<b>Elective – II: Theory</b>
		<b>Credit: 5</b>

### **UNIT I**

**History of E-commerce and Indian Business Context :** E-Commerce –Emergence of the Internet – Emergence of the WWW – Advantages of E-Commerce – Transition to E-Commerce in India – The Internet and India – E-transition Challenges for Indian Corporates.

**Business Models for E-commerce:** Business Model – E-business Models Based on the Relationship of Transaction Parties - E-business Models Based on the Relationship of Transaction Types.

### **UNIT II**

**Enabling Technologies of the World Wide Web:** World Wide Web – Internet Client-Server Applications – Networks and Internets – Software Agents – Internet Standards and Specifications – ISP. **e-Marketing :** Traditional Marketing – Identifying Web Presence Goals – Online Marketing – E-advertising – E-branding.

### **UNIT III**

**e-Security :** Information system Security – Security on the Internet – E-business Risk Management Issues – Information Security Environment in India.

**Legal and Ethical Issues :** Cyberstalking – Privacy is at Risk in the Internet Age – Phishing – Application Fraud – Skimming – Copyright – Internet Gambling – Threats to Children.

### **UNIT IV**

**e-Payment Systems:** Main Concerns in Internet Banking – Digital Payment Requirements – Digital Token-based e-payment Systems – Classification of New Payment Systems – Properties of Electronic Cash – Cheque Payment Systems on the Internet – Risk and e-Payment Systems – Designing e-payment Systems – Digital Signature – Online Financial Services in India - Online Stock Trading.

## **UNIT V**

**Information systems for Mobile Commerce:** What is Mobile Commerce? – Wireless Applications – Cellular Network – Wireless Spectrum – Technologies for Mobile Commerce – Wireless Technologies – Different Generations in Wireless Communication – Security Issues Pertaining to Cellular Technology. **Portals for E-Business:** Portals – Human Resource Management – Various HRIS Modules.

### **BOOK FOR STUDY**

E-Commerce - An Indian Perspective, P.T.Joseph, S.J., Fourth Edition, PHI 2012.

### **BOOK FOR REFERENCE**

E-Commerce Strategy, Technologies and Applications David Whiteley Tata Mc-Graw-Hill

<b>2012-13 Onwards</b>	<b>Elective – II</b> <b>SOFTWARE PROJECT</b> <b>MANAGEMENT</b>	<b>B.Sc., Computer Science</b>
<b>VI Semester</b>		<b>Elective – II: Theory</b>
		<b>Credit: 5</b>

**UNIT - I**

Introduction to software project management – Project evaluation and Programme Management – An overview of Project Planning.

**UNIT - II**

Selection of an appropriate project approach – Software effort estimation – Activity planning

**UNIT - III**

Risk management - Resource allocation.

**UNIT - IV**

Monitoring and control - Managing contracts.

**UNIT - V**

Managing people in Software Environments – Working in Teams - Software quality.

**BOOK FOR STUDY**

“Software Project Management” by Bob Hughes and Mike Cotterell, Tata McGraw-Hill 5<sup>th</sup> Edition

<b>2012-13 Onwards</b>	<b>Elective – III</b> <b>DATA MINING AND</b> <b>WARE HOUSING</b>	<b>B.Sc., Computer Science</b>
<b>VI Semester</b>		<b>Elective – III: Theory</b>
		<b>Credit: 5</b>

### **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 naïve algorithm- apriori algorithm – improve the efficient of the apriori algorithm – mining frequent pattern without candidate generation (FP-growth) – performance evaluation of algorithms.

### **UNIT – II**

**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 – III**

**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 – IV**

**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.

## **UNIT – V**

**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

### **BOOK FOR STUDY:**

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

Delhi, 2008. 2<sup>nd</sup> Edition, PHI , 2011

### **BOOK FOR REFERENCE**

Data Mining Techniques, Arun K Pujari , University Press

<b>2012-13 Onwards</b>	<b>Elective - III MULTIMEDIA SYSTEMS</b>	<b>B.Sc., Computer Science</b>
<b>VI Semester</b>		<b>Elective- III : Theory</b>
		<b>Credit: 5</b>

### **UNIT I**

Multimedia Definition – Use Of Multimedia – Delivering Multimedia – Text: About Fonts and Faces – Using Text in Multimedia – Computers and Text – Font Editing and Design Tools – Hypermedia and Hypertext.

### **UNIT II**

Images: Plan Approach – Organize Tools – Configure Computer Workspace – Making Still Images – Color – Image File Formats. Sound: The Power of Sound – Digital Audio – Midi Audio – Midi vs. Digital Audio – Multimedia System Sounds – Audio File Formats – Vaughan’s Law of Multimedia Minimums – Adding Sound to Multimedia Project.

### **UNIT III**

Animation: The Power of Motion – Principles of Animation – Animation by Computer – Making Animations that Work. Video: Using Video – Working with Video and Displays – Digital Video Containers – Obtaining Video Clips – Shooting and Editing Video.

### **UNIT IV**

Making Multimedia: The Stage of Multimedia Project – The Intangible Needs – The Hardware Needs – The Software Needs – An Authoring Systems Needs. Multimedia Production Team.

### **UNIT V**

Planning and Costing: The Process of Making Multimedia – Scheduling – Estimating – RFPs and Bid Proposals. Designing and Producing – Content and Talent: Acquiring Content – Ownership of Content Created for Project – Acquiring Talent

**BOOK FOR STUDY:**

“Multimedia: Making It Work” - Tay Vaughan( Eight Edition)

**BOOK FOR REFERENCE**

Ralf Steinmetz & Klara Nahrstedt – “Multimedia Computing, Communication & Applications “ Pearson Education



<b>2012-13 Onwards</b>	<b>Elective – III</b>  MOBILE COMPUTING	<b>B.Sc., Computer Science</b>
<b>VI Semester</b>		<b>Elective – III: Theory</b>
		<b>Credit: 5</b>

#### **UNIT – I**

**Introduction:** Applications – A Simplified Reference Mode. **Wireless Transmission:** Cellular System. **Medium Access Control :** Motivation for a Specialized MAC : Hidden and exposed terminals – Near and far terminals – SDMA – FDMA – TDMA : Fixed TDM – Classical Aloha – Slotted Aloha – Carrier Sense Multiple Access – Demand assigned Multiple Access – PRMA Packet Reservation Multiple Access – Reservation TDMA – Multiple Access With Collision Avoidance – Polling – Inhibit Sense Multiple Access. CDMA: Spread Aloha multiple access.

#### **UNIT – II**

**Telecommunication Systems:** GSM: Mobile Services – System Architecture – Radio Interface – Protocols - Localization And Calling – Handover – Security – New Data Services. DECT: System Architecture – Protocol Architecture - TETRA.

#### **Unit – III**

UMTS and IMT 2000: UMTS Releases and Standardization – UMTS System Architecture - UMTS Radio Interface – UTRAN – Core Network – Handover. **Satellite System:** History – Applications – Basics: GEO – LEO – MEO . Routing – Localization – Handover.

**Broadcast Systems:** Overview – Cyclical Repetition Of Data – Digital Audio Broadcasting – Digital Video Broadcasting – Convergence of Broadcasting and Mobile Communication.

#### **UNIT – IV**

**Wireless LAN:** Infra Red Vs Radio Transmission – Infrastructure and Ad-Hoc Network – IEEE 802.11: System Architecture – Protocol Architecture – Physical Layer – Medium Access Control Layer – MAC Management – HIPERLAN: HIPERLAN1 -WATM – BRAN

– HiperLAN2. Bluetooth: User scenarios – Architecture – Radio layer – Base band layer – Link manager protocol.

## **UNIT – V**

**Mobile Network Layer:** Mobile IP – Dynamic Host Configuration Protocol – Mobile Ad-Hoc Networks. **Mobile Transport Layer:** Traditional TCP-Classical TCP Improvement-TCP Over 2.5/3G Wireless Networks – Performance Enhancing Proxies.

## **BOOK FOR STUDY**

“**Mobile Communications**”, Jochen Schiller ,Pearson Education.,Second Edition.

<b>SBEC-1: Basics on Interment</b>	
Course	Common for B.Sc(CS) , B.Sc(IS) & BCA
Effective from	2012 – 2013 and Onwards
Semester	II
SBEC	<b>SKILLED BASED ELECTIVE COURSE – I</b>

### **UNIT I**

What is Internet ? The Internet"s underlying Architecture

### **UNIT II**

Connecting to the Internet – Communicating on the Internet

### **UNIT III**

How the World Wide Web works. Common Internet tools

### **UNIT IV**

Multimedia on the Internet – Intranet and shopping on the Internet

### **UNIT V**

Safeguarding the Internet

### **BOOK FOR STUDY**

How the Internet works – Techmedia – Preston Gralla Millennium Edition, fourth Edition

<b>SBEC-II: Exploring on Word</b>	
Course	Common for B.Sc(CS) & BCA
Effective from	2012 – 2013 and Onwards
Semester	IV
SBEC	<b>SKILLED BASED ELECTIVE COURSE – II</b>

#### UNIT I

Exploring word 2007: Working in the Word Environment - Opening, Moving Around in, and Closing a Document – Displaying Different Views of a Document – Creating and Saving a Document - Previewing and Printing a Document.

#### UNIT II

Editing and Proofreading Documents: Make Changes to a Document – Insert Saved Text – Find the Most Appropriate word – Reorganize a Document Outline – Find and Replace Text.

#### UNIT III

Error Corrections: Correct Spelling and Grammatical Errors – Finalize a Document. - Changing the Look: Quickly Format Text and Paragraphs – Manually Change the Look of Characters. – Manually Change the Look of Paragraphs.

#### UNIT IV

Bulleted and Numbered Lists: - Create and Modify Lists - Presenting Information in Columns. Creating Table: Creating a Table: Create a Tabular List – Present Information in a Table.

#### UNIT V

Formatting a Table: Format Table Information – Perform Calculation in a Table – Use a Table to Control Page Layout.

### **BOOK FOR STUDY**

Step by Step 2007 Microsoft Office System Joyce Cox & Team , PHI Learning Private limited, New Delhi, 2009

<b>SBEC - III : MS Access</b>	
Course	B.Sc(CS)
Effective from	2012 – 2013 and Onwards
Semester	V
SBEC	<b>SKILLED BASED ELECTIVE COURSE - V</b>

**UNIT I:**

Creating a Database: Creating a Database from a Template – Creating a Table Manually – Creating a Table by Using a Template – Manipulating Table Columns and Rows.

**UNIT II:**

Simplifying Data Entry by Using Forms : Creating a Form by Using the Form Tool – Refining Form Properties – Changing the Arrangement of a Form – Adding Controls to a Form – Entering Data in a Form by Using VBA – Creating a Form by Using an AutoForm – Adding a Subform to a Form .

**UNIT II:**

Sorting and Filtering: Sorting Information in a table – Filtering Information in a Table – Filtering Information by Using a Form – Locating Information That Matches Multiple Criteria.

**UNIT IV:**

Query Processing: Creating a Query Manually – Creating a Query by Using a Wizard – Performing Calculations by Using a Query.

**UNIT V:**

Keeping Your Information Accurate: Restricting the Type of Data in a Field – Restricting the Amount of Data in a Field – Specifying the Format of Data in a Field – Restricting Data by Using Validation Rules – Updating Information in a Table.

## BOOK FOR STUDY

Step by Step 2007 Microsoft Office System Joyce Cox & Team , PHI Learning Private limited, New Delhi, 2009

<b>SBEC – IV : SOFT SKILLS</b>	
Course	Common for B.Sc(CS) & B .Sc(IS)
Effective from	2012 – 2013 and Onwards
Semester	V
SBEC	<b>SKILLED BASED ELECTIVE COURSE - IV</b>

### UNIT I

**Nature of technical communication:** Stages of communication – Channels of communication – Nature of technical communication – Importance and need for technical communication – Technical communication skills.

### UNIT II

**The Listening process:** Types of listening – Listening with a purpose – Barriers to listening – The speech process – Conversion and oral skills – Body language.

### UNIT III

**Job interviews:** Pre – interview preparation techniques – Interview questions – Answering strategies – Frequently asked interview questions – Projecting a positive image – Alternative interview formats.

### UNIT IV

**Group Discussion:** Nature of group discussion – Characteristics of successful group discussions – Selection group discussion – Group discussion strategies – Techniques for individual contribution – Group interaction strategies.

### UNIT V

**Presentation Skills:** Planning the presentation – Preparing the presentation – Organizing your presentation – Rehearsing the presentation – Improving delivery

**BOOK FOR STUDY**

Effective Technical Communication , M. Ashraf Rizvi, Tata McGraw – Hill Publishing Company Limited , New Delhi.

<b>SBEC - V:Excel &amp; PowerPoint</b>	
Course	B.Sc(CS)
Effective from	2012 – 2013 and Onwards
Semester	VI
SBEC	<b>SKILLED BASED ELECTIVE COURSE – III</b>

**UNIT I:**

Setting Up a Workbook: Creating Workbooks – Modifying Workbooks – Modifying Worksheets – Customizing the Excel 200 Program Window – Arranging Multiple Workbook Windows. Working with Data and Data Tables: Entering and Revising Data – Moving Data within a Workbook – Finding and Replacing Data – Defining a Table. Performing

**UNIT II:**

Calculations on Data: Naming Groups of Data – Creating Formulas to Calculate Values – Finding and Correcting Errors in Calculations. Changing Document Appearance: Formatting Cells – Defining Styles – Applying Workbook Themes and Table Styles – Making Numbers Easier to Read – Adding Images to a Document.

**UNIT III:**

Starting a New Presentation: Quickly Creating a Presentation – Creating a Presentation Based on a Ready-Made design – Converting an Outline to a Presentation. Working with Slide Text: Entering Text – Editing Text – Adding and Manipulating Text Boxes – Correcting and Sizing Text While Typing – Checking Spelling and Choosing the Best Words.

**UNIT IV:**

Adjusting the Slide Layout, Order, and Look: Changing the Layout of a Slide – Rearranging Slides in a Presentation – Applying a Theme – Switching to a Different Color Scheme –



Using Colors That Are Not Part of the Scheme – Adding Shading and Texture to the Background of a Slide.

**UNIT V:**

Delivering a Presentation Electronically: Adapting a Presentation for Different Audiences – Rehearsing a Presentation – Preparing a Presentation – Preparing Speaker Notes and Handouts – Preparing a Presentation for Travel.

**BOOK FOR STUDY**

Step by Step 2007 Microsoft Office System Joyce Cox & Team , PHI Learning Private limited, New Delhi, 2009

<b>SBEC-VI : FLASH</b>	
Course	Common for B.Sc(CS) & BCA
Effective from	2012 – 2013 and Onwards
Semester	VI
SBEC	<b>SKILLED BASED ELECTIVE COURSE – VI</b>

### **UNIT – I**

Introducing Flash: How Flash works – Uses of Flash – Obtaining Flash – Installing Flash – The Flash Environment- Getting Started: The Timeline – The Stage – Tools and toolbars –

### **UNIT – II**

The Menu bar – Properties Inspector – Panels – Viewing options – Quick Start templates – Accessibility Creating Objects: Stage and overlay objects – Tools panel. Editing Objects : Grouping objects – Free Transform tool – Reshaping objects – Aligning objects

### **UNIT – III**

Pixel snapping – Stacking order – Cut aways – Paste in place. Color and Text: Standard Color palette – Adding solid colors – Adding gradients – Fill Transform tool – More color options – Selecting colors – Adding, Formatting and Manipulating text.

### **UNIT – IV**

Symbols and Instances: Definitions – The Library – Converting objects to symbols – Creating a new symbol – Symbol Editing Mode – Editing symbols – Editing Instances.  
Sound and Video: Using sound – Importing sound – Editing sounds, Adding video – Manipulating video.

### **UNIT – V**

Frames and Layers: Working with frames – Adding frames – Deleting and copying frames – Frame properties – Working with layers – Inserting layers – Deleting and copying layers – Animation: Elements of animation – Scenes – Frame-by-frame animation – Motion tweening – Motion guides – Shape tweening – Animating text – Distribute text to layers – Movie clips.

### **BOOK FOR STUDY:**

1. “FLASH MX in easy steps” - NICK VANDOME, Dreamtech, New Delhi

<b>NMEC - I : Fundamentals of Information Technology</b>	
Course	<b>Offered to other department Students (Other than CA Departments)</b>
Effective from	2012 – 2013 and Onwards
Semester	III
NMEC	Non Major Elective Course

### **UNIT - I**

Introduction to Information Technology: Information Technology – Understanding the Digital Domain – Representing Numbers and text in Binary- binary codes

### **UNIT - II**

Fundamentals of Computers: Computer Hardware – Software – system software- application software- Translators- Computer languages-MLL-HLL-ALL

### **UNIT - III**

Transmission of Information: Fundamentals of Communications – Fiber Optics – Wireless Communications -ISDN

### **UNIT - IV**

Computer Networking: Goals – Topologies - Local Area Networks – Wide Area Networks – Communication Protocols-

### **UNIT - V**

Internet: Internet Architecture -- Types-Network Security-Internet applications- Internet address- domain name- E-mail

### **BOOK FOR STUDY**

Introduction to Information Technology Pelin Aksoy, Laura DeNardis,Cengage Learning India Private Limited, First Indian Reprint 2008.

<b>NMEC-I : Basics of Computers and Office Automation</b>	
<b>Course</b>	<b>Offered to other department Students</b>
<b>Effective from</b>	2012 – 2013 and Onwards
<b>Semester</b>	III
<b>NMEC</b>	Non Major Elective Course

### **UNIT – I**

Introduction to Computers – Five Generations of Modern Computers – Classification of Digital Computer Systems – Anatomy of a Digital Computer – Memory UNITS – Input and Output Devices – Auxiliary Storage Devices.

### **UNIT – II**

Getting Started: Starting a Program – Identifying Common Screen Elements – Choosing Commands – Finding Common Ways to Work – Getting Help with Office

### **UNIT – III**

MS-WORD: Learning Word Basics – Formatting a Word Document – Working with Longer Document.

### **UNIT – IV**

MS-EXCEL: Creating a Simple Spreadsheet – Editing a Spreadsheet – Working with Functions and Formula – Formatting Worksheets – Completing Your Spreadsheet – Creating Charts

### **UNIT – V**

MS-POWERPOINT: Creating and Viewing Presentations – Editing a Presentation – Working with Presentation Special Effects

### **BOOK FOR STUDY:**

1. Introduction to Computers – Alex Leon, Mathew Leon (UNIT – I)
2. Microsoft Office XP – fast & easy (UNIT II, III, IV & V) Author: DIANE KOERS  
 Publisher: Prentice Hall of India Private Limited, New Delhi, 2001

<b>NMEC-II : Introduction to Object Oriented Programming Language C++</b>	
Course	<b>Offered to other department Students</b>
Effective from	2012 – 2013 and Onwards
Semester	IV
NMEC	Non Major Elective Course

### UNIT – I

**Overview of C++ Language:** Object Oriented Concepts – Characteristics- Advantages- Keywords and Identifiers-Constants-Variables-Data types- Operators and Expressions

### UNIT – II

Program structure –Conditional Statements: If Statement – Switch statement – Goto Statement. Looping Statements: while Loop-For Loop Do-While Loop-Jumps in Loops – Break – Continue statements

### UNIT – III

**Functions:** Advantages of Functions-Classification of Functions-Inline Functions-Function Overloading –Reference Variables – Storage Classes -Arrays: Definition of an Arrays-Arrays and Functions- Simple programs

### UNIT – IV

**Classes and Objects-** Passing Objects as arguments – Returning an object from functions – Arrays of objects – Members of classes – Static member data – Static member functions - Simple programs

### UNIT – V

**Constructors and Destructors-**Types of Constructors-Destructor and its Characteristics, Inheritance- Simple programs Types of **Inheritance** –Simple programs

### BOOK FOR STUDY

“Programming in C++”, M. T. Somashekara, Prentice Hall of India Private Limited, New Delhi, 2008

<b>NMEC-II : HTML and Web Design</b>	
Course	<b>Offered to other department Students (Other than CA Departments)</b>
Effective from	2012 – 2013 and Onwards
Semester	IV
NMEC	Non Major Elective Course

### **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

### **BOOK FOR STUDY:**

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

### **BOOK FOR REFERENCE:**

1. C.Xavier , “ World Wide Web Design with HTML”, TMH 2007