PERIYAR UNIVERSITY
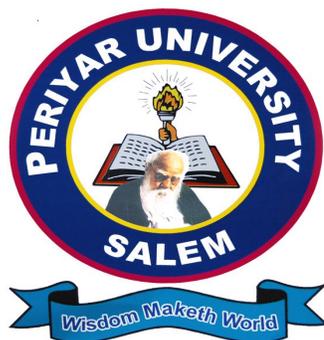
PERIYAR PALKALAI NAGAR

SALEM – 636 011

**DEGREE OF BACHELOR OF SCIENCE
IN COMPUTER SCIENCE**

[CHOICE BASED CREDIT SYSTEM]

SYLLABUS FOR B.Sc., (COMPUTER SCIENCE)

**FOR THE STUDENTS ADMITTED FROM THE
ACADEMIC YEAR 2017 – 2018 ONWARDS**

PERIYAR UNIVERSITY, SALEM – 11

REGULATIONS FOR B.Sc., (COMPUTER SCIENCE) DEGREE COURSE WITH SEMESTER SYSTEM

(Effective from the academic year 2017-2018)

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 there to by the syndicate, subject to such conditions as may be prescribed there to are permitted to appear and qualify for the **Bachelor of Science in 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 units in each subject. Part -I, Part-II, Part – III, Part – IV and Part-V subjects are as prescribed in the scheme of examination.

4. EXAMINATIONS

The theory examination shall be three hour duration for each paper at the end of every semester. The candidate failing in any subject(s) will be permitted to appear in the subsequent examination. The practical examinations for core subjects should be conducted at the end of the every 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 certified that the candidate has performed the experiments prescribed for the course. For such candidates 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. PASSING MINIMUM MARKS

Theory
The candidate shall be declared to have passed the examination if the candidate **secure not less than 40 marks** put together out of 100 marks (**CIA + EA).Minimum 40% should be secured (30 out of 75) in EA** of each theory subject.

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 marks (**CIA + EA). Minimum 40% should be secured (24 out of 60) in EA** of each Practical subject.

7. MARKS DISTRIBUTION AND QUESTION PAPER PATTERN FOR B.Sc., CS

7.1 Theory –Marks Distribution

Maximum Marks   : 100 Marks
External [EA]   : 75 Marks
Internal [CIA]   : 25 Marks

7.1(a). Theory - Question Paper Pattern [External] (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   (Total Marks: 25)

Attendance   :5 Marks
Assignment   :5 Marks
Test   :15 Marks

7.2. Practical – Marks Distribution

Maximum Marks   : 100 Marks
External [EA]   : 60 Marks
Internal [CIA]   : 40 Marks

7.2(a).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) Display the correct output   - 20%

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

Practical Question Paper Pattern

> **Student should attend two questions (either or pattern)**
> Note:
> (i) Practical I to Practical VI and SBEC Practical has same pattern
> (ii) Core Practical Examination must be conducted at the end of every Semester

7.2(b). Practical - Internal Marks Distribution (Total Marks: 40)

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

8. COMMENCEMENT OF THIS REGULATION:

These regulations shall take effect from the academic year 2017-2018, i.e, for students who are to be admitted to the first year of the course during the academic year 2017-18 and thereafter.

Scheme of Examinations from the Academic Year 2017-2018
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
CORE THEORY	6	4	7	4	12	8	41
CORE 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 EDUCATION	2	-	-	-	-	-	2
EXTENSION ACTIVITY	-	-	-	-	-	1	1
Cumulative Total Credits	**22**	**24**	**23**	**24**	**25**	**27**	**145**

SEMESTER – I

Sem	Part	Sub Code	Subject	Hours		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	-	6	25	75	100
			Practical - I : Assembly Language Programming	-	4	4	40	60	100
			Allied I : Paper – I	6	-	4	25	75	100
	IV		Value Education	2	-	2	25	75	100
			Total	**26**	**4**	**22**	**165**	**435**	**600**

SEMESTER – II

Sem	Part	Sub Code	Subject	Hours		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		C Programming	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 (Practical)	-	4	3	25	75	100
	IV		**SBEC – I :** System Administration and Maintenance	1	1	2	25	75	100
			Environment Studies	1	-	2	25	75	100
			Total	**22**	**8**	**24**	**215**	**585**	**800**

SEMESTER – III

Sem	Part	Sub Code	Subject	Hours Lect.	Hours Lab	Credit	CIA	EA	Total
III	I		Tamil - III	6	-	3	25	75	100
	II		English – III	6	-	3	25	75	100
			Object Oriented Programming with C++	3	-	3	25	75	100
			Data Structures and Algorithms	4	-	4	25	75	100
			Practical – III : Programming in C++	-	3	4	40	60	100
			Allied II: Paper – I	4	-	4	25	75	100
			Allied II: Practical Lab – I (*)	-	2	-	-	-	-
	IV		Tamil/ Advanced Tamil (OR) Non –Major Elective – I NMEC –I	2	-	2	25	75	100
			Total	**25**	**5**	**23**	**190**	**510**	**700**

SEMESTER – IV

Sem	Part	Sub Code	Subject	Hours Lect.	Hours Lab	Credit	CIA	EA	Total
IV	I		Tamil - IV	6	-	3	25	75	100
	II		English – IV	6	-	3	25	75	100
	III		Relational Database Management Systems	4	-	4	25	75	100
			Practical – IV:RDBMS	-	3	4	40	60	100
			Allied II : Paper – II	5	-	4	25	75	100
			Allied II: Practical Lab – I(*)	-	2	2	40	60	100
	IV		**SBEC – II:** Internet and its Applications	1	1	2	25	75	100
			Tamil/ Advanced Tamil (OR) Non –Major elective – II NMEC – II	2	-	2	25	75	100
			Total	**24**	**6**	**24**	**230**	**570**	**800**

* Allied Practical Examination will be conducted at the end of even semester.

SEMESTER – V

Sem	Part	Sub Code	Subject	Hours		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
V	III		GUI Programming	5	-	4	25	75	100
			Operating Systems	5	-	4	25	75	100
			Computer Networks	5	-	4	25	75	100
			Elective – I	5	-	5	25	75	100
			Practical – V: Programming in VB	-	5	4	40	60	100
	IV		**SBEC – III: Practical-**Shell Programming	-	3	2	40	60	100
			SBEC – IV: Multi Skill Development	2	-	2	25	75	100
			Total	**22**	**8**	**25**	**190**	**510**	**700**

SEMESTER – VI

Sem	Part	Sub Code	Subject	Hours		Credit	Marks		
				Lect.	Lab		CIA	EA	Total
VI	III		Java Programming	5	-	4	25	75	100
			Software Engineering	5	-	4	25	75	100
			Elective – II	5	-	5	25	75	100
			Elective – III	5	-	5	25	75	100
			Practical – VI: Programming in Java	-	5	4	40	60	100
	IV		**SBEC –V:Practical-**Image Editing Tool		3	2	40	60	100
			SBEC –VI:PHP Scripting Language	2		2	25	75	100
	V		Extension Activities	-	-	1			
			Total	**22**	**8**	**27**	**190**	**510**	**700**

ELECTIVE SUBJECTS

Elective – I

Sem.	Part	Subject Code	Subject
V	III		Discrete Structures
			Multimedia
			Problem Solving Techniques

Elective – II

Sem.	Part	Subject Code	Subject
VI	III		Data Mining and Warehousing
			Unified Modeling Language
			Web Technologies

Elective – III

Sem.	Part	Subject Code	Subject
VI	III		Mobile Computing
			Computer Graphics
			Internetworking with TCP/IP

SBEC – Skill Based Elective Courses

Part	Sem.	Sub. Code	Subject	Hours Lect.	Hours Lab	Credit	CIA	EA	Total
IV	II		**SBEC – I :** System Administration and Maintenance	1	1	2	25	75	100
	IV		**SBEC – II :** Internet and its Applications	1	1	2	25	75	100
	V		**SBEC –III :Practical-**Shell Programming	-	3	2	40	60	100
	V		**SBEC - IV** : Multi Skill Development	2	-	2	25	75	100
	VI		**SBEC – V:Practical-**Image Editing Tool	-	3	2	40	60	100
	VI		**SBEC-VI :**PHP Scripting Language	2	-	2	25	75	100

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

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

Part	Sem.	Sub. Code	Subject	Lect. Hours	Credit	CIA	EA	Total
IV	III		**NMEC I:** Basics of Computers	2	2	25	75	100
			NMEC I: System Administration and Maintenance	2	2	25	75	100
	IV		**NMEC II:** Office Automation	2	2	25	75	100
			NMEC II: Basics of Internet	2	2	25	75	100

Allied Subjects for any Degree offered by the Department of Computer Science

SYLLABUS - CBCS PATTERN
EFFECTIVE FROM THE ACADEMIC YEAR 2017-2018

All Papers should be handled and valued by Computer Science Department only. For University practical examinations both Internal and External examiners should be appointed from Computer Science Department.

FIRST OPTION (Allied Computer Science)

First Year / Second Year (Select any one of the Subject with Practical)

Part	Semester	Subject	Hours		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	I /III	**Allied Paper – I** C Programming	4	-	3	25	75	100
		Allied Practical – I Programming in C	-	3	2	40	60	100
	II / IV	**Allied Paper – II** C++ Programming	4	-	3	25	75	100
		Allied Practical – II Programming in C++	-	3	2	40	60	100

SECOND OPTION (Allied Computer Science)

First Year / Second Year (Select any one of the Subject with Practical)

Part	Semester	Subject	Hours		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	I / III	**Allied Paper – I** Database Systems	4	-	3	25	75	100
		Allied Practical – I MS-Access	-	3	2	40	60	100
	II / IV	**Allied Paper – II** E – Commerce Techniques	4	-	3	25	75	100
		Allied Practical – II HTML Programming	-	3	2	40	60	100

THIRD OPTION (Allied Computer Science)

First Year / Second Year (Select any one of the Subject with Practical)

Part	Semester	Subject	Hours		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	I / III	**Allied Paper – I** Computer Applications in Office	4	-	3	25	75	100
		Allied Practical – I Office Automation	-	3	2	40	60	100
	II / IV	**Allied Paper – II** Image Editing Tool	4	-	3	25	75	100
		Allied Practical – II Image Editing Software	-	3	2	40	60	100

FOURTH OPTION (Allied Computer Science)

First Year / Second Year (Select any one of the Subject with Practical)

Part	Semester	Subject	Hours		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	I / III	**Allied Paper – I** PHP Scripting Language	4	-	3	25	75	100
		Allied Practical – I PHP Programming	-	3	2	40	60	100
	II / IV	**Allied Paper – II** Basics of Computer and Financial Computing	4	-	3	25	75	100
		Allied Practical – II Financial Computing Software	-	3	2	40	60	100

Allied Papers for B.Sc. Computer Science offered by other Departments

I - YEAR (Allied – I: First Option)

Part	Semester	Subject	Hours		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
	II	Allied I : Paper – III : Practical	-	4	3	40	60	100

I -YEAR (Allied – I: Second Option)

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

I-Year (Allied – I: Statistics –Third Option)

Part	Semester	Subject	Hours		Credit	Marks		
			Lect.	Lab		CIA	EA	Total
III	I	Allied I :Paper–I: **Allied Statistics –I**	6	-	4	25	75	100
	II	Allied I: Paper–II: **Allied Statistics–II**	4	-	3	25	75	100
	II	Allied I :Paper–III: **Allied Statistics–III (Practical)**	-	4	3	40	60	100

II - YEAR (Allied – II: COMMERCE -First Option)

Part	Semester	Subject	Hours		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	Hours		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	Hours		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

2017-18 Onwards	DIGITAL COMPUTER FUNDAMENTALS AND MICROPROCESSOR	B.Sc., Computer Science
I Semester		Core: Theory
Hours: 6		Credits: 6

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.

TEXT BOOKS:

1. Thomas C Bartee, "Digital Computer Fundamentals", 6th Edition, T.M.H Publisher, New Delhi, 1991.

2. Ramesh S Gaonkar, "Microprocessor Architecture Programming and Application with the 8085",5th Edition, 2002.

REFERENCE BOOKS:

1. Deborah Morley, Charles S. Parker, "Understanding Computers- Today and Tomorrow", 1^{st}Edition, Thomson Course Technology, 2007

2. N.K. Srinath, "8085 Microprocessor Programming and Interfacing", PHI Publishing, 2005.

2017-18 Onwards	PRACTICAL - I : ASSEMBLY LANGUAGE PROGRAMMING	B.Sc., Computer Science
I Semester		Core: Practical
Hours: 4		Credits: 4

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. Arrange the given numbers in ascending order.

6. Find the largest number in the given set.

7. Convert HEX number to Decimal number.

8. Convert Decimal number to Binary.

9. Convert Decimal Number to BCD.

10. Perform BCD addition.

2017-18 Onwards	**C PROGRAMMING**	**B.Sc., Computer Science**
II Semester		**Core: Theory**
Hours: 4		**Credits: 4**

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 – Data types – Declaration of variables - Declaration of storage classes – Assigning values to variables- Defining symbolic constants. Operators and expression: Types of Operators –Arithmetic Expressions - Evaluation of expressions – Precedence of arithmetic operators – Type conversions in expressions – Operator precedence and associativity. 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.

TEXT BOOK

1. E. Balgurusamy, "Programming in ANSI C", 5th Edition, Tata McGraw Hill, New Delhi, 2010.

REFERENCE BOOKS

1**.** Herbert Schildt, **"**C: The complete Reference", 4th Edition, Mc Graw Hill,2003.

2. B.L.Juneja,"Programming in C", 1st Edition,Cengage Learning, 2012.

2017-18 Onwards	**PRACTICAL – II:**	**B.Sc., Computer Science**
II Semester	**PROGRAMMING IN C**	**Core: Practical**
Hours: 3		**Credits: 4**

1. Write a program to find the sum, average, standard deviation for a given set of numbers.

2. Write a program to print prime numbers up to a given number.

3. Write a program to convert a decimal number into binary.

4. Write a program to multiply two matrices using functions.

5. Calculate the binomial co-efficient using functions.

6. Write a program to check whether a given word is a palindrome or not.

7. Implement binary search to find a particular name in a list of names.

8. Arrange a set of numbers in ascending order.

9. Write a program to print the Student's Mark sheet assuming Register number, name, and marks in 5 subjects in a Structure. Create an array of Structures and print the mark sheet in the university pattern.

10. Write a program to count the number of alphabets, special characters and words in a line of text using file.

2017-18 Onwards	OBJECT ORIENTED PROGRAMMING WITH C++	B.Sc., Computer Science
III Semester		Core: Theory
Hours: 3		Credits: 3

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

TEXT BOOK

1. E.Balagurusamy, "Object Oriented Programming with C++", 5th Edition, Tate McGraw Hill Publications, 2011.

REFERENCE BOOKS

1. M. T. Somashekara, "Object Oriented programming with C++", 2nd Edition, Prentice Hall of India Learning Limited, 2012.
2. Behrouz A.Forouzan, "A Structured Approach Using C++", 2ndEdition, Cengage Learning, 2003.

2017-18 Onwards	**DATA STRUCTURES AND ALGORITHMS**	B.Sc., Computer Science
III Semester		**Core: Theory**
Hours: 4		**Credits: 4**

UNIT -I

Algorithms (Analysis and design): Problem solving – Top-Down and Bottom- up approaches to algorithm design – Use of algorithms in problem solving – Design, Implementation, Verification of algorithm – Efficiency analysis of algorithms: Space, Time complexity, and Frequency count – Sample algorithms: Exchange the value of two variables – Summation of set of numbers – Decimal to Binary conversion – Sorting – Factorial – Fibonacci – Finding a largest Number in an array - Reverse the order of elements in array.

UNIT- II

Introduction: Definitions – concepts – Overview – Implementation of Data Structures. Arrays: Definition – Terminology - One dimensional array – Multi Dimensional Array. 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 –Various Queue Structures: Circular Queue – De-queue – Priority Queue – Applications of Queues: CPU Scheduling. Linked List: Definition -Single Linked List - Double Linked List - Circular Double Linked List – Applications: Sparse Matrix - Polynomial.

UNIT- IV

Trees: Terminologies – Definitions &Concepts – Representation of Binary tree – Operations on Binary Tree – Types of Binary Trees: Expression Tree – Binary Search Tree – Heap Tree – Red Black Tree. Graphs: Introduction – Graph terminologies – Representation of Graphs – Operations on Graphs – Applications of Graph: Shortest path problem - Minimum Spanning Tree: Kruskal and Prims Algorithm.

UNIT- V

Searching: Terminologies – Linear Search techniques with – Array, Linked List, and Ordered List - Binary search - Non Linear Search- Binary Tree Searching – Binary Search Tree Searching .Sorting: Terminologies – Sorting Techniques – Insertion Sort - Selection sort – Bubble sort – Quick sort – Merge sort.

TEXT BOOKS

1. Sathish Jain, Shashi Singh, "Data Structure Made Simple", 1st Edition, BPB Publications, New Delhi, 2006.

 2. Debasis Samanta, "Classic Data Structures", 2nd Edition, PHI Learning, New Delhi, 2009.

REFERENCE BOOKS

1. Aprita Gopal, "Magnifying Data Structures", 1st Edition, PHI Learning, New Delhi, 2010.

2. Chitra A &Rajan PT, "Data Structures", 2nd Edition, Vijay Nicole Publications, 2016.

2017-18 Onwards	**PRACTICAL - III :**	**B.Sc., Computer Science**
III Semester	**PROGRAMMING IN C++**	**Core: Practical**
Hours: 3		**Credits: 4**

1. Write a C++ program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write member functions ADD (),SUB(), MUL(), DIV() to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.

2. Write a C++ program to create a class FLOAT that contains one float data member. Overload all the four Arithmetic operators so that they operate on the object FLOAT.

3. Write a C++ program to create a class STRING. Write a Member Function to initialize, get and display stings. Overload the operators ++ and == to concatenate two Strings and to compare two strings respectively.

4. Write a C++ program to create class, which consists of EMPLOYEE Detail like E_Number, E_Name, Department, Basic, Salary, Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.

5. Write a C++ program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS Calculate_Area() and Calculate_Perimeter() to calculate area and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGE from class Shape and Calculate Area and Perimeter of each class separately and display the result.

6. Write a C++ program using function overloading to read two matrices of different data types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.

7. Write a program to convert an Infix Expression to Postfix Expression using arrays.

8. Write a C++ program to create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the STACK. Write a member function PUSH() to insert an element and member function POP() to delete an element. Check for overflow and underflow conditions.

9. Write a C++ program to check whether the given string is a palindrome or not using pointers.

10. Write a C++ program to merge two files into a single file

2017-18 Onwards	RELATIONAL DATABASE MANAGEMENT SYSTEMS	B.Sc., Computer Science
IV Semester		Core: Theory
Hours: 4		Credits: 4

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

Transaction Management: Transaction concepts - States – Serializability. Lock based concurrency control : Locks – Granting – Two-Phase Locking protocol. Time stamp based protocol: Timestamps – Timestamp ordering protocol – Dead lock handling.

TEXT BOOK

1. A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", 5th Edition McGraw-Hill, 2005.

REFERENCE BOOKS

1. Alexix Leon & Mathews Leon, "Essential of DBMS", 2nd reprint, Vijay Nicole Publications, 2009.

2. Alexix Leon & Mathews Leon, "Fundamentals of DBMS", 2nd Edition, Vijay Nicole Publications, 2014.

2017-18 Onwards	**PRACTICAL - IV:**	**B.Sc., Computer Science**
IV Semester	**RDBMS**	**Core: Practical**
Hours: 3		**Credits: 4**

1. Use DDL-create and DML-insert commands
   - (i) Create tables according to the following definition.
     > Deposit (actno varchar2(5) ,cname varchar2(18) , bname varchar2(18) , amount number(8,2) ,adate date);
     > Branch(bname varchar2(18),city varchar2(18));
     > Customers(cname varchar2(19) ,city varchar2(18)); create table borrow(loanno varchar2(5), cname varchar2(18), bname varchar2(18), amount number (8,2));

   - (ii) Insert the data for the above relations.
   - (iii) From the above given tables perform the following queries:
     - a) Describe deposit, branch.
     - b) Describe borrow, customers.
     - c) List all data from table DEPOSIT.
     - d) List all data from table BORROW.
     - e) List all data from table CUSTOMERS.
     - f) List all data from table BRANCH.
     - g) Give account no and amount of depositors.
     - h) Give name of depositors having amount greater than 4000.
     - i) Give name of customers who opened account after date '1-12-96'.

2. Create the below given table and insert the data accordingly.
   > Create Table Job (job_id, job_title, min_sal, max_sal)
   > Create table Employee (emp_no, emp_name, emp_sal, emp_comm, dept_no)
   > Create table deposit(a_no,cname,bname,amount,a_date).
   > Create table borrow(loanno,cname,bname,amount).

   Perform following queries
   - a) Retrieve all data from employee, jobs and deposit.
   - b) Give details of account no. and deposited rupees of customers having account opened between dates 01-01-06 and 25-07-06.
   - c) Display all jobs with minimum salary is greater than 4000.
   - d) Display name and salary of employee whose department no is 20. Give alias name to name of employee.
   - e) Display employee no,name and department details of those employee whose department lies in(10,20)

3. Use various options of LIKE predicate

   a) Display all employee whose name start with 'A' and third character is ' 'a'.

   b) Display name, number and salary of those employees whose name is 5 characters long and first three characters are 'Ani'.

   c) Display the non-null values of employees and also employee name second character should be 'n' and string should be 5 character long.

   d) Display the null values of employee and also employee name's third character should be 'a'.

   e) What will be output if you are giving LIKE predicate as '%_%' ESCAPE '\'

4. Perform various data manipulation commands, aggregate functions and sorting concept on all created tables

   a) List total deposit from deposit.

   b) List total loan from a particular branch

   c) Count total number of customers

   d) Count total number of customer's cities.

   e) Create table supplier from employee with all the columns.

   f) Create table sup1 from employee with first two columns.

   g) Delete all the rows from sup1.

   h) Delete the detail of supplier whose sup_no is 103.

   i) Update the value dept_no to 10 where second character of emp. name is 'm'

5. Write a PL/SQL code block that will accept an account number from the user and debit an amount of Rs. 2000 from the account if the account has a minimum balance of 500after the amount is debited. The Process is to fired on the Accounts table.

6. Write a PL/SQL code block to calculate the area of the circle for a value of radius varying from 3 to 7. Store the radius and the corresponding values of calculated area in a table Areas. Areas – radius, area.

7. Write a PL/SQL block of code for reversing a number. (Example : 1234 as 4321).

8. Create a transparent audit system for a table Client_master (client_no, name, address, Bal_due). The system must keep track of the records that are being deleted or updated. The functionality being when a record is deleted or modified the original record details and the date of operation are stored in the auditclient(client_no, name, bal_due,operation,userid, opdate) table, then the delete or update is allowed to go through.

9.   Implement a GUI based database application for BANK Database to support the following:

- Insertion of new customers, accounts

- Deletion of customers, accounts

- Withdrawal and deposit of amount

10. Implement a GUI based database application for Bus Reservation database to support the following.

- Insert the details of Passenger and Bus

- Delete the details of Passenger and Bus

- Passenger Ticket Booking.

2017-18 Onwards	GUI PROGRAMMING	B.Sc., Computer Science
V Semester		Core: Theory
Hours: 5		Credits: 4

UNIT – I

Introduction to Visual Basic: Programming Languages, Procedural, Object Oriented and Event Driven, Writing VB Projects, VB Environment, Writing First Project-Finding and Fixing Errors – VB Help. Controls in VB – Coding for Controls.

UNIT – II

Variables, Constants and Calculations: Data Types-Variables and Constants – Val function – Arithmetic operations – Formatting data. Decisions and conditions: If Statements – Conditions – nested If Statements – Using If Statement with option buttons and checkboxes – displaying messages – Input validation – Calling event Procedures.

UNIT – III

Menus, Sub procedures and sub functions: Menus – Common Dialog Boxes – Writing General Procedures. Multiple Forms: Multiple Forms – Standard Code Modules-Variables and Constants in Multiple-Form Projects.

UNIT – IV

List Boxes and Combo boxes - Do/Loop – For/Next Loop – Using Msgbox Function – Using String Function – Arrays: Control Arrays – Single Dimension Array – For Each/Next Statements – User defined data types – Multidimensional Arrays.

UNIT – V

Accessing Database Files: Visual basic and Database Files – Using Data Control – Viewing a Database File – Navigating the Database in Code – Using List Boxes and Combo boxes as Data-Bound Controls.

TEXT BOOK:

1. Julia Case Bradley and Anita C.Millspaugh, "Programming in Visual Basic 6.0", Tata McGraw-Hill Edition, 2011.

REFERENCE BOOKS:

1. Gary Cornell, "Visual Basic 6 from the Ground up", McGraw-Hill Education,1998
2. Mohammed Azam, "Programming with Visual Basic 6.0", 1st Edition, Vikas Publishing House Pvt. Ltd., Chennai, 2001.

2017-18 Onwards	**OPERATING SYSTEMS**	B.Sc., Computer Science
V Semester		**Core: Theory**
Hours: 5		**Credits: 4**

UNIT – I

Introduction – History of operating system- Different kinds of operating system – Operation system concepts - System calls-Operating system structure.

UNIT – II

Processes and Threads: Processes – threads – thread model and usage – inter process communication.

UNIT – III

Scheduling - Memory Management: Memory Abstraction – Virtual Memory - page replacement algorithms.

UNIT – IV

Deadlocks: Resources- introduction to deadlocks – deadlock detection and recovery – deadlocks avoidance – deadlock prevention. Multiple processor system: multiprocessors – multi computers.

UNIT – V

Input / Output: principles of I/O hardware - principles of I/O software. Files systems: Files – directories - files systems implementation – File System Management and Optimization.

TEXT BOOK
1. Andrew S. Tanenbaum, "Modern Operating Systems", 2nd Edition, PHI private Limited, New Delhi, 2008.

REFERENCE BOOKS
1. William Stallings, "Operating Systems – Internals & Design Principles",5th Edition, Prentice – Hall of India private Ltd, New Delhi, 2004.

2. Sridhar Vaidyanathan, "Operating System", 1st Edition,Vijay Nicole Publications, 2014.

2017-18 Onwards	COMPUTER NETWORKS	B.Sc., Computer Science
V Semester		Core: Theory
Hours: 5		Credits: 4

UNIT – I

Introduction - Network Hardware – Network Software - Reference Models: OSI Reference model. Physical Layer: Guided Transmission media- Wireless Transmission - Public Switched Telephone Network- The Mobile Telephone System.

UNIT – II

Data Link Layer: Data Link Layer Design Issues - Error Detection and Correction – Elementary protocols - Sliding Window Protocols – MAC sub layer: Channel allocation problem –Multiple access protocols.

UNIT – III

Network Layer: Network Layer Design Issues- Routing Algorithms- Congestion control algorithm - Quality of Service –Internetworking.

UNIT - IV

Transport Layer: Transport Services – Elements of transport protocols – Congestion control – Internet transport protocol - UDP – TCP.

UNIT – V

Application layers: Domain name system – Electronic mail – The World Wide Web. Network Security: Cryptography – Symmetric, Public key algorithms.

TEXT BOOK
1. David J.Wetherall, Andrew S.Tanenbaum, "Computer Networks",5th Edition,Pearson Education, 2012.

REFERENCE BOOKS
1. B.A. Forouzan, "Data Communication and Networking", 4th Edition, Tata McGraw Hill, 2007.
2. B.A. Forouzan,FirouzMosharraf, "Computer Networks – A Top down Approach", Tata McGraw Hill, 2012.
3. A.Leon&M.Leon, "Introduction to Information Technology", 1st Edition, Vijay Nicole Publications, 2013.

2017-18 Onwards	**PRACTICAL - V:**	**B.Sc., Computer Science**
V Semester	**PROGRAMMING IN VB**	**Core: Practical**
Hours: 5		**Credits: 4**

1. Construction of an Arithmetic Calculator (Simple)

2. Writing simple programs using loops and decision making statements.

    a. Generate Fibonacci series.

    b. Find the sum of N numbers.

    c. To display the numbers/symbols in triangle format.

3. Write a program to create a menu and MDI Forms.

4. Write a program to create a simple input screen with four basic controls to read input and write it to a file.

5. Write a program to display files in a directory using DriveListBox, DirListBox and FileListBox control and open, edit and save text file using Rich text box control

6. Write a program to illustrate Common Dialog Control and to open, edit and save text file

7. Write a program to develop windows based installation file with Student Registration form and Login form using database access.

8. Develop a program to Insert, update, delete a Record in database using ADO

9. Write a program to implement Personal Information System using MDI and Standard ADODC controls and reports.

10. Write a program to implement animation using timers.

2017-18 Onwards	**JAVA PROGRAMMING**	B.Sc., Computer Science
VI Semester		**Core: Theory**
Hours: 5		**Credits: 4**

UNIT – I

Java Evolution – Simple Java Program – Java program structure – Java Tokens – Java Statements – JVM – Command Line Arguments – Constants, Variables, and Data Types – Operators and Expressions.

UNIT – II

Decision Making and Branching: Introduction – Decision Making with if Statement – Simple if Statement – The if…else Statement – Nesting of if…else Statement – The else if Ladder – The Switch Statement – The ?: Operator. Decision Making and Looping: Introduction – The While Statement – The Do Statement – The For Statement – Jumps in Loops – Labelled Loops. Classes, Objects and Methods: Introduction – Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance – Overriding Methods – Final Variables and Methods – Final Classes – Finalizer Methods – Abstract Methods and Classes – Methods with Varargs – Visibility Control.

UNIT – III

Arrays, Strings and Vectors: Introduction – One-dimensional Arrays – Creating an Array – Two-dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types – Annotations. Interfaces: Introduction – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables – Packages: Introduction – Java API Packages – Using System Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import.

UNIT – IV

Multithreaded Programming: Introduction – Creating Threads – Extending the Thread class – Stopping and Blocking a Thread - Life cycle of a Thread – Using Thread methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the Runnable interface – Inter-thread Communication. Managing Errors and Exceptions: Introduction – Types of Errors –

Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing Our Own Exceptions. Applet Programming: Introduction – Difference Between Applets and Applications – Write Applets - Building Applet code - Applet life cycle - Creating an Executable Applet – Designing a web page – Applet Tag – Adding Applet to HTML File – Running the applet – Applet Tags –Passing Parameters to Applets – Aligning the Display – Displaying Numerical values – Getting input from the user – Event handling.

UNIT – V

Graphics Programming: Introduction – The Graphics Class - Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts. ManagingI/O Files in Java:Introduction – Concept of stream – Stream classes – Byte stream classes – Character stream classes – Using stream – Using the file class – Creation of Files – Reading/Writing characters – Reading/Writing Bytes – Handling Primitive Data types – Concatenating and buffering Bytes - Random access files.

TEXT BOOK

1. E. Balagurusamy, "Programming with Java," 4th Edition, Tata McGraw Hill Publication, New Delhi, 2009.

REFERENCE BOOKS

1.Herbert Schild, "Java: The Complete Reference," Ninth Edition, Oracle Press, 2014

2. RohitKhurana, "Programming with JAVA", VIKAS Publications, 2014

3. Gokila, "Advanced Java Programming", Vijay Nicole Publications, 2014.

4. Muthu C, "Essentials of Java Programming", 2nd reprint, Vijay Nicole Publications, 2014.

5. Muthu C, "Programming with Java", 2nd Edition, Vijay Nicole Publications, 2014.

2017-18 Onwards	SOFTWARE ENGINEERING	B.Sc., Computer Science
VI Semester		Core: Theory
Hours: 5		Credits: 4

UNIT – I

Introduction – Software Engineering Discipline – Evolution and Impact – Programs Vs Software Products. 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.

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).Object Modeling Using UML: Overview of Object-Oriented Concepts - 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.

TEXT BOOK

1. Rajib Mall, "Fundamentals of Software Engineering",3rd Edition, Prentice Hall of India Private Limited, 2008.

REFERENCE BOOKS

1. Rajib Mall, "Fundamentals of Software Engineering", 4thEdition, Prentice Hall of India Private Limited, 2014.
2. Richard Fairley, "Software Engineering Concepts", TMGH Publications, 2004.

2017-18 Onwards	PRACTICAL – VI:	B.Sc., Computer Science
VI Semester	PROGRAMMING IN JAVA	Core: Practical
Hours: 5		Credits: 4

1. Write a program to find the Area of Square, Rectangle and Circle using Method Overloading.

2. Write a program to sort the list of numbers using Command Line Arguments.

3. Write a program to multiply the given two matrices.

4. Write a program to design a class to represent a bank account. Include the following:

   Data Members: Name of the depositor, Account number, Type of account, and Balance amount in the account.

   Methods: To assign initial values, To deposit an amount, To withdraw an amount after checking balance, and To display the name and balance.

5. Write a program that import the user defined package and access the Member variable of classes that contained by Package.

6. Write a program to handle the Exception using try and multiple catch blocks.

7. Write a program to illustrate the use of multithreads.

8. Write a program to create student registration form using applet with Name, Address, Sex, Class, Email-id.

9. Write a program to draw the line, rectangle, oval, text using the graphics method.

10. Write a program to create a sequential file that could store details about five products. Details include product code, cost, and number of items available and are provided through the keyboard. Compute and print the total value of all the five products.

2017-18 Onwards	Elective – I :	B.Sc., Computer Science
V Semester	DISCRETE STRUCTURES	Elective: Theory
Hours: 5		Credits: 5

UNIT - I

Sets and Propositions: Definition and representation of sets - basic set operations - Venn diagrams – Set Identities – Principle of Inclusion – Exclusion. Propositions: Introduction – Well formed formulas - truth table – Tautology, Contradiction, Contingency – Propositional Equivalences – Logic- Connectives - Predicates and Quantifiers.

UNIT - II

Functions and Relations: Definition and examples – One-to-one and onto functions – Permutations. Relations: Definition and examples - Binary Relations – Properties - Equivalence and Partial Ordering – representation of relation in matrix, by Digraph - closure operations on relations.

UNIT - III

Algebraic Systems: Definition and examples, Semi groups and monoids: Definitions and examples, Subsemigroups and Submoniods- Homomorphism of Semigroups and Moniods. Groups: Definitions and examples.

UNIT - IV

Graph Theory: Introduction – Definition and Examples – Edges sequence, walks, paths and circuits – Directed graph- Subgraph and operations on the graph - Isomorphic graphs - Connected - Matrix representation of Graphs.

UNIT - V

Trees: Introduction – Properties – Special Classes of Trees-Definition of spanning tree – minimal spanning tree.

TEXT BOOK
1. N. Chandrasekaran, M.Umaparvathi, "Discrete Mathematics", PHI Publications, 2010.

REFERENCE BOOKS
1. J.P Tremblay, R.Manohar, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw-Hill Publishing Company Limited, 2001.
2. Kenneth H Rosen, "Discrete Mathematics and its Applications", 7th Edition,Tata McGraw Hill, 2012.

2017-18 Onwards	Elective – I :	B.Sc., Computer Science
V Semester	**MULTIMEDIA**	**Elective: Theory**
Hours: 5		**Credits: 5**

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

TEXT BOOK

1. Tay Vaughan, "Multimedia: Making It Work", 8th Edition, Osborne/McGraw-Hill, 2001.

REFERENCE BOOK

1. Ralf Steinmetz & Klara Nahrstedt – "Multimedia Computing, Communication & Applications", Pearson Education, 2012.

2017-18 Onwards	Elective – I :	B.Sc., Computer Science
V Semester	PROBLEM SOLVING TECHNIQUES	Elective: Theory
Hours: 5		Credits: 5

UNIT- I:

Problem Solving: Introduction - The Problem-solving Aspect - Top-down Design-implementation of Algorithms- Program Verification - The Efficiency of Algorithms.

UNIT-II:

Fundamental Algorithms: Exchanging the values of Two Variables - Counting - Summation of a set of Numbers - Factorial Computation-Sine function computation - Generation of the Fibonacci sequence - Reversing the Digits of an Integer - Base Conversion Character to Number Conversion.

UNIT- III:

Factoring Methods: Finding the square Root of a number - The Greatest Common Divisor of Two Integers - Generating Prime Numbers - Generation of Pseudo - random Numbers - Raising a Number to a Large Power.

UNIT - IV:

Array Techniques: Array Order Reversal-Array Counting or Histogramming - Finding the Maximum Number in a Set - Removal of Duplicates from an Ordered Array - Partitioning an Array – Finding the kth Smallest Element.

UNIT - V:

Merging, Sorting and Searching: Two way merge - sorting by selection, insertion, diminishing increment and partitioning –Binary search.

TEXT BOOK
1. R.G.Dromey, "How to Solve it by Computer", Pearson Education, India, 2011.

REFERENCE BOOK
1. SeyMour Lipschutz, "Essentials Computer Mathematics", 4th Edition, Schaums outlines series, Tata McGrawHill, 2004.

2017-18 Onwards	Elective – II:	B.Sc., Computer Science
VI Semester	DATA MINING AND WAREHOUSING	Elective: Theory
Hours: 5		Credits: 5

UNIT – I

Introduction: Data mining application – data mining techniques – data mining case studies- the future of data mining – data mining software - Association rules mining: 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- Naive 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.

TEXTBOOK
1. G.K. Gupta, "Introduction to Data mining with case studies", 2nd Edition, PHI Private limited, New Delhi, 2011.

REFERENCE BOOK
1. Arun K Pujari, "Data Mining Techniques", 10th impression, University Press, 2008.

2017-18 Onwards	Elective – II :	B.Sc., Computer Science
VI Semester	UNIFIED MODELLING LANGUAGE	Elective: Theory
Hours: 5		Credit: 5

UNIT - I

Introduction : Role of Analysis and Design in Software Development – Object Orientation – Overview of various OOAD Methodologies - Goals of UML. Use Case Modeling: Actors and Use Cases – Use Case Relationships – Writing Use Cases Formality –Choosing the System Boundary – Finding Actors – Finding Use Cases –Use of Use Cases for Validation and Verification – Use case Realization.

UNIT - II

Static Modelling Using Class Diagrams: Classes and Objects – Attributes and Operations –Visibility of Attributes and Operations – Class Scope Attribute – Mapping Class to Java Code - Attributes with Default Values – Association – Role Names –Qualified Association – Association Class – Ternary Association – Recursive Association – Multiple Association between Two Classes – Aggregation – Generalization – Abstract Class – Subclass Partitioning - Generalization Set – Interfaces – Packages and Grouping of Classes into Packages –Parameterized Classes.

UNIT- III

Interaction Diagrams: Introduction to Interaction Diagram – Creating New objects – Combining Fragments – Communication Diagrams.

UNIT - IV

Dynamic Modelling Using State and Activity Diagrams: State Machines – Events – States and Transitions – Formal Syntax for Specifying a State Transition - Substates – Modelling Complex Transitions – The History Indicator - The Junction State- The Synch State – The Submachine Reference and the Stub States – Activity Diagrams – Swimlanes – Dynamic Concurrency – Decomposing an Activity – Activity diagrams for Career Guidance Portal. The unified Process of Software Development: The Unified Process of Software Development – Phases of the Unified Software Development Process – Best Practices in the Unified Process – Workflows of the UP.

UNIT - V

Architectural Modelling: Subsystem – Broker Architecture for Distributed Systems– Model View Controller Architecture - Component Diagrams – Deployment Diagrams. Case Study: Simulation of Cell Phone – Social Networking Site.

Text Book

1. Mahesh P.Matha, "Object Oriented Analysis and Design Using UML", PHI Learning Private Ltd. NewDelhi, 2010.

Reference Book

1. Jason T. Roff, "UML –A Beginner's Guide", 1st Edition, Tata McGraw – Hill, 2003.

2017-18 Onwards	Elective – II: WEB TECHNOLOGIES	B.Sc., Computer Science
VI Semester		Elective: Theory
Hours: 5		Credits: 5

UNIT-I

Internet Principles: Introduction to Internet – Client Server Model– Protocol – Internet IP Address- Domain Name – Internet Services – Electronic Mail – World Wide Web – Internet Security – E-Commerce - EDI.

UNIT -II

Introduction to HTML: HTML Tags – HTML Documents – Headings – Hyperlinks using Anchor Tag– Formatting Characters – Font – Images and Pictures – Listing – Tables in HTML Tags – Frameset Definition – Fame Definition– Nested framesets – HTML Forms – Elements of a form use Tags.

UNIT -III

JavaScript : Data Types – Variables – Operators – Conditional statements using Javascript – Document Objects – Image Objects using Javascript – Forms and Elements – Event Handling – Browser Object – Submit Event and Data Validation –Parseint() Function - ParseFloat() Function – Recursive Function.

UNIT-IV

Server Side Script with JSP: Client Responsibilities –Server Responsibilities – Introduction to JSP – JSP Architecture – JSP Servers – JSP Tags – Request Object – Response Object – JSP Page.

UNIT - V

JSP with JDBC : Creating ODBC Data Source Name – Introduction to JDBC –Telephone Directory with JDBC – Servlet Environment and Role – Protocol Support – HTML Support – Servelt Life Cycle — HTML to Servlet Communication .

TEXT BOOK

1. C.Xavier, "Web Technology and Design", 1st Edition, New Age International,2011.

REFERENCE BOOK

1. H.M.Deitel, P.J.Deitel, "Internet and World Wide Web – How to Program", 3rd Edition, Pearson Publication, 2006.

2017-18 Onwards	Elective – III:	B.Sc., Computer Science
VI Semester	MOBILE COMPUTING	Elective: Theory
Hours: 5		Credits: 5

UNIT – I

Introduction: Applications - A Simplified Reference Model. Wireless Transmission: Frequencies for radio transmission – Signals – Antennas - Signal Propagation – Multiplexing – Modulation – Spread Spectrum - Cellular System.

UNIT – II

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. Comparison of S/T/F/CDMA.

Unit – III

Telecommunication Systems: GSM - Mobile Services – System Architecture – Radio Interface – Protocols - Localization and Calling – Handover – Security. UMTS and IMT 2000: UMTS releases and standardization - UMTS System Architecture - UMTS Radio Interface –UTRAN - UMTS Handover.

UNIT – IV

Satellite System: History – Applications – Basics - Routing– Localization – Handover. Wireless LAN: IEEE 802.11- System Architecture – Protocol Architecture - Physical Layer – Medium Access Control Layer. Bluetooth: User scenarios – Architecture – Radio Layer – Baseband Layer – Link Manager Protocol.

UNIT – V

Mobile Network Layer: Mobile IP - Goals, Assumption, and Requirements – Entities and Terminology – IP Packet delivery – Agent discovery – Registration. Dynamic Host Configuration Protocol - Mobile Transport Layer: Traditional TCP - Congestion Control – Slow Start – Fast Retransmit.

TEXT BOOK
1. Jochen Schiller, "Mobile Communications",2nd Edition, eighth impression, Pearson Education, 2011.

REFERENCE BOOKS
1. William Stallings,"Wireless Communication and Networks", 2nd Edition, Pearson Education, 2005.
2. Theodore Rappaport, "Wireless Communications: Principles and Practice", Prentice Hall Communications,1996.

2017-18 Onwards	Elective – III : COMPUTER GRAPHICS	B.Sc., Computer Science
VI Semester		Elective : Theory
Hours: 5		Credits: 5

UNIT – I

Overview of graphics Systems: Video Display Device – Refresh Cathode-Ray tubes Raster – Scan Displays Random – Scan Displays – Color CRT Monitors –Direct view Storage tubes Flat – Panel Displays Three – Dimensional Viewing Devices. Stereoscopic and Virtual – Reality Systems.

UNIT – II

Raster – Scan Systems Video Controller – Random – Scan Systems Video Controller – Random-Scan Systems – Input device – Keyboard Mouse – Trackball and Space ball . Joysticks – Data Glove – Digitizers- Image Scanners – Touch Panels – Light pens. Voice Systems – Hard-Copy Devices – Line Drawing Algorithms DDA Algorithms – Circle generating Algorithm Properties of Ellipses.

UNIT – III

Two Dimensional Geometric Transformation: Basic Transformations - Translation – Rotation – Scaling – Matrix Representations and Homogeneous Coordinates – Other Transformations Reflections Two Dimensional Viewing : Windows to view point coordinate Transformations – Clipping Operations – Point Clipping – Line Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

UNIT – IV

Three Dimensional Concepts: Three Dimensional Display method – Parallel projection – Depth cueing visible line and surface – Three Dimensional Geometric and modeling Transformations: Translation – Rotation - Scaling – Composite Transformations. Three Dimensional Viewing: Viewing pipeline – Viewing Coordinates – Projections – Parallel Projections – Perspective Projections.

UNIT – V

Visible Surface Detection Methods : Classification Visible Surface Detection Algorithms – Back Face Detection – Depth – Buffer Method – A-Buffer Method – Scan line method – Depth sorting method – BSP tree method – Area Subdivision Method.

TEXT BOOK:

1. Donald Hearn & M.Pauline Baker , "Computer Graphics",2nd Edition, 1996

REFERENCE BOOK:

1. John f. Hughes, Andries Van Dam, Morgan Mcguire, David F. Sklar, James D. Foley, Steven K. Feiner, Kurt Akeley, "Computer GraphicsPrinciples and Practice" 3rdEdition, Pearson Education,2014.

2017-18 Onwards	Elective – III :	B.Sc., Computer Science
VI Semester	INTERNETWORKING WITH TCP/IP	Elective: Theory
Hours: 5		Credits: 5

UNIT- I

Introduction and overview – Network Technologies - Internetworking concepts and architectural model –Classful Internet address

UNIT - II

Mapping Internet Address to Physical Addresses – Internet Protocol - Connectionless Datagram Delivery (IPv4) –Forwarding IP Datagrams –Error and Control Message (ICMP).

UNIT- III

User Datagram Protocol (UDP) – Reliable Stream Transport Service (TCP) – Routing Architecture - Cores, Peers and Algorithms.

UNIT- IV

Internet Multicasting – Mobile IP – Private Network Interconnection.

UNIT- V

The Domain Name System (DNS) – Electronic Mail – Voice and Video Over IP – Network Management –IPv6

TEXT BOOK

1. Douglas E.Comer, "Internetworking with TCP/IP Principles, Protocols and Architecture", Vol 1 & 2, 5th Edition, PHI, 2006.

REFERENCE BOOKS

1. Behrouz A.Forouzan, "TCP/IP protocol suite", 4th Edition, Tata McGraw Hill, 2003.
2. W.Richard Stevens "TCP/IP illustrated" Volume 2, Pearson Education, 2003.

SBEC-I: SYSTEM ADMINISTRATION AND MAINTENANCE	
Course	B.Sc(CS)
Effective from	2017 – 2018 Onwards
Semester	II
SBEC	**SKILL BASED ELECTIVE COURSE**
Hours: 2	**Credits: 2**

UNIT – I

Introduction to Personal Computer: Computer System – Purposes& Characteristics of Cases – Power Supplies – Internal Components – Ports – Cables – Input devices – Output devices. Safe Lab Procedures and Tool Use: Safe Working Conditions and Procedures – Tools and Software used with PC components.

UNIT – II

Computer Assembly: Open Case – Install Power Supply – Attach Components to Motherboard - Installation: Motherboard - Internal Drives – Drives in External Bayes -Adapter Cards. Internal cables connections –Reattach side panels – Connection of external cables – Boot the Computer. Preventive Maintenance and Troubleshooting: Purpose of Preventing Maintenance – Steps of Troubleshooting Process.

UNIT – III

Fundamental Operating System: Purposes – Characteristics of Modern Operating Systems – Concepts–Comparisons, Limitations, and Compatibilities – Determination of Operating System based on Customer Needs – Installation of Operating System –Navigate a GUI (Windows) – Common Preventive Maintenance Techniques– Troubleshoot.

UNIT – IV

Fundamental Laptops and Portable Devices: Common Uses – Components of Laptop – Comparison of the components of Desktop and Laptops – Configure Laptops – Mobile Phone Standards – Preventive Maintenance Techniques – Troubleshoot Laptop and Portable Devices. Fundamental Printers and Scanners: Types of Printers and Scanners - Installation and Configuration Process of Printers and Scanners – Preventive Maintenance Techniques – Troubleshoot.

UNIT –V

Fundamental Networks: Principles – Types – Concepts and Technologies – Physical Components – LAN Topologies and Architectures– Standard Organizations – Ethernet Standards – OSI and TCP/IP Models – Configuration of NIC and Modem – Establishing Connectivity - Preventive Maintenance Techniques – Troubleshoot. Fundamental Security: Security Threats – Security Procedures - Preventive Maintenance Techniques – Troubleshoot Security.

TEXTBOOK

1. David Anfinson & Ken Quamme, "IT Essentials: PC Hardware and Software Companion Guide", 3rd Edition, Pearson Publications, 2008.

REFERENCE BOOK

1. Quentin Docter, Emmett Dulaneyand Toby Skandier, "CompTIA A+ Complete Review Guide: Exam 220-901, Exam 220 – 902", 3rd Edition, Wiley Publications, 2015.

SBEC-II: INTERNET AND ITS APPLICATIONS	
Course	B.Sc (CS)
Effective from	2017 – 2018 Onwards
Semester	IV
SBEC	**SKILL BASED ELECTIVE COURSE**
Hours: 2	**Credits: 2**

UNIT - I

Introduction To The Internet: Computer in Business – Networking – Internet - E-mail – Resource Sharing – Gopher – World Wide Web – Telnet – Bulletin Board Service – Wide Area Information Service.

UNIT – II

Internet Technologies: Modem - Internet addressing – Physical connections – Telephone Lines – Internet browsers – Internet Explorer – Netscape Navigator.

UNIT - III

Web Server – Proxy Server – Web Browser – Search Engines – Search Tools – Firewalls – Data Security.

UNIT – IV

Internet Relay Chat – Types of Network – Packet Switched Network – Circuit Switched Network – TCP/IP – Internet Protocol.

UNIT - V

Case Study: Online Passport – Online Gas Services – Online Train Reservation – Tamilnadu government services

TEXTBOOKS
1. C Xavier, "World Wide Web with HTML", Tata McGraw Hill Education, 2000.
2. H.M.Deital, P.J. Deital, "Internet and World Wide Web – How to Program", 4th Edition "PHI Learning.
3. Raj Kamal, "Internet and Web Technologies", 7th Reprint, Tata McGraw Hill Education, 2007.

REFERENCE WEBSITES
1. http://www.ebharatgas.com/
2. http://passportindia.gov.in/
3. https://www.irctc.co.in
4. http://www.tn.gov.in/

SBEC –III: PRACTICAL -SHELL PROGRAMMING	
Course	B.Sc(CS)
Effective from	2017 – 2018 Onwards
Semester	V
SBEC	**SKILL BASED ELECTIVE COURSE**
Hours: 3	**Credits: 2**

1. Write a shell script to implement the file commands: rm, cp, cat, mv, cmp, wc, split, diff.

2. Write a shell script to print the following system configuration:

   a) currently logged user and his log name

   b) current shell , home directory , Operating System type , current path setting , current working directory

   c) show currently logged number of users, show all available shells

   d) show CPU information like processor type , speed

   e) show memory information

3. Write a shell script to implement the following: pipes, redirection and tee commands.

4. Write a shell script for displaying current date, user name, file listing and directories by getting user choice.

5. Write a shell script to modify "cal" command to display calendars of the specified range of months.

6. Write a shell script to find the sum of the individual digits of a given number.

7. Write a shell script to find the greatest among the given set of numbers using command line arguments.

8. Write a shell script for palindrome checking.

9. Write a shell script to print the multiplication table of the given argument using for loop.

10. Write a shell script to compare two files and if found equal delete the duplicate file.

SBEC - IV : MULTI SKILL DEVELOPMENT	
Course	B.Sc(CS)
Effective from	2017 – 2018 Onwards
Semester	V
SBEC	**SKILL BASED ELECTIVE COURSE**
Hours: 2	**Credits: 2**

UNIT- I

Communication: Question tag – Gerund and Infinitives – Spotting the errors – Vocabulary – Synonyms – Antonyms - Prepositions – Articles – One word substitution – Sentence completion.

UNIT - II

Numerical Aptitude : Problems on numbers - Problems on Ages – Percentage - Profit and loss - Ratio & Proportion - Time & Work - Time & Distance - Simple Interest - Compound Interest.

UNIT - III

Critical Reasoning: Logical Inference Questions and Syllogism. Analytical Reasoning: Arrangement problems – Family / Blood Relation Qualms – Sense of Directions – Age Doubts. Verbal Reasoning: Verbal Analogy: Letter series - number series – Coding and Decoding.

UNIT- IV

Self Introduction - Soft Skills - Interpersonal Skills – Employability Skills – Soft Skills Training – Resume Preparation – Interview Tips and Questions.

UNIT- V

Group Discussion – Importance – Types of GD – GD Skills – GD Etiquette – Essential Elements of a GD – Movements and Gestures to be avoided in a GD

TEXT and REFERENCE BOOKS

1. Hari Mohan Prasad & Uma Rani Sinha, "Objective English for Competitive Examinations", Tata McGraw Hill Education Private Ltd., (Unit – I)

2. R.S. Aggarwal, "Quantitative Aptitude", S.Chand 2010. (Unit - II)

3. R.S. Agarwal, "A Modern Approach to Verbal Reasoning (Fully Solved)" –Revised Edition, S.Chand Company Limited, New Delhi, 2012. (Unit – III)

4. M. S. Rao, "Soft Skills Enhancing Employability-Connecting Campus with Corporate", IK International Publishing House, NewDelhi, 2010. (Unit – IV)

5. Alex.K, "Soft Skills-Know Yourself and Know the World", S.Chand Company Ltd., 2011. (Unit- V)

SBEC – V : PRACTICAL - IMAGE EDITING TOOL	
Course	B.Sc(CS)
Effective from	2017 – 2018 Onwards
Semester	VI
SBEC	**SKILL BASED ELECTIVE COURSE**
Hours: 3	**Credits: 2**

1. Design a greeting card for birthday using different text effects.

2. Apply various filter effects to an image.

3. Design the front page of the college calendar using gradient.

4. Create a pattern using pattern stamp tool and clone stamp tool.

5. Design a web page layout.

6. Design a bunch of flowers.

7. Perform/Simulate Plastic Surgery on any part of the face.

8. Create See-through texts

9. Convert Black and White Photo to Color Photo

10. Fill a text with an appropriate image (Example: The word "Flower" should be filled with some flower images)

SBEC-VI : PHP SCRIPTING LANGUAGE	
Course	B.Sc(CS)
Effective from	2017 – 2018 Onwards
Semester	VI
SBEC	**SKILL BASED ELECTIVE COURSE**
Hours: 2	**Credits: 2**

UNIT – I

Basic of Coding in PHP: Mixing PHP and HTML – Introducing Variables and Operators – PHP Variables.

UNIT – II

Displaying Dynamic Content – Sending E-Mail – Using File System – Uploading Files to Website**.**

UNIT – III

Establishing a connection – Creating a Database Table – Inserting Data into the Table – Selecting and Displaying Data.

UNIT – IV

System Planning - Adding Contacts Modifying Contacts - Deleting Contacts - Working with Contacts.

UNIT – V

Managing a Simple Mailing List**:** Mailing List Software – Developing Subscription Mechanism, Mailing Mechanism. Creating Custom Logs and Reports.

TEXTBOOK

1. Julie Meloni, Matt Telles, "PHP 6", 3rd Edition, Cengage Learning India Edition, 2009.

REFERENCE BOOKS

1. Julie Meloni, Matt Telles, "PHP 6 Fast and Easy Web Development", 1st Edition, Cengage Learning India Edition, 2008.
2. Steven Holzner, "The Complete Reference PHP", Indian Edition, McGraw Hill Education, 2007.

NMEC-I : BASICS OF COMPUTERS	
Course	**Offered to other department students**
Effective from	2017 – 2018 Onwards
Semester	III
NMEC	Non Major Elective Course
Hours: 2	**Credits: 2**

UNIT-I

Introduction to Computer: Introduction – Types of computers – Characteristics of Computers. Generations of Computers: First Generation – Second Generation – Third Generation – Fourth Generation – Fifth Generation. Classification of Digital Computers: Introduction – Microcomputers – Personal Computer – Portable Computers – Mini Computers – Super Computers – Main Frames.

UNIT – II

Number System: Introduction – Decimal Number System – Binary Number System – Binary-Decimal Conversion – Decimal Binary Conversion – Binary Addition – Binary Subtraction – Complements – 9's Complement – 10's Complement – 1's Complements – 2's Complements – BCD - Bits, Bytes, Words – Octal – Hexadecimal Number System.

UNIT-III

Anatomy of Digital Computer : Functions and Components of Computer – Central Processing Unit – Control Unit – Arithmetic – Logic Unit – Memory – Registers – Addresses. Memory Units: RAM, ROM, PROM, EPROM, EEPROM, And Flash Memory.

UNIT-IV

Input Devices: Introduction – Keyboard – Mouse – Types of Mice – Connections – Mouse pad – Trackball – joystick – Digitizing Tablet – Scanners – Digital Camera – MICR – OCR – OMR – Bar Code Reader – Speech Input Device- Touch Screen – Touch Pad – Light Pen. Output Devices: Introduction – Monitor – Classification of Monitors – Monochrome – Gray Scale – Color – Digital Monitor – Analog Monitor – Characteristics of monitor – Printers.

UNIT – V

Computer Software: Introduction – Operating System – Utilities – Compiler and Interpreters – Word Processor – Spreadsheets – Presentation Graphics – DBMS – Programming Languages: Machine Language – Assembly Language – High level language – Types of High Level Language. Data Processing: Data VS Information – File Processing – Sequential File Processing – Direct Access file Processing.

TEXT BOOK:

1. Alexis Leon and Mathews Leon, "Fundamentals of Computer Science and Communication Engineering", Leon Techworld, 1998.

REFERENCE BOOKS:

1. B Ram and Sanjay Kumar, "Computer Fundamentals", 5th Edition, New Age International Publishers, 2014.
2. Pradeep K Sinha, Priti Sinha, "Computer Fundamentals", BPB Publications, 2004.
3. Anita Goel, "Computer Fundamentals", 1st Edition, Pearson Education India, 2010.

NMEC-I : SYSTEM ADMINISTRATION AND MAINTENANCE	
Course	**Offered to other department Students**
Effective from	2017 – 2018 Onwards
Semester	III
NMEC	Non Major Elective Course
Hours: 2	Credits: 2

UNIT – I

Introduction to Personal Computer: Computer System – Purposes& Characteristics of Cases – Power Supplies – Internal Components – Ports – Cables – Input devices – Output devices. Safe Lab Procedures and Tool Use: Safe Working Conditions and Procedures – Tools and Software used with PC components.

UNIT – II

Computer Assembly: Open Case – Install Power Supply – Attach Components to Motherboard - Installation: Motherboard - Internal Drives – Drives in External Bayes -Adapter Cards. Internal cables connections –Reattach side panels – Connection of external cables – Boot the Computer. Preventive Maintenance and Troubleshooting: Purpose of Preventing Maintenance – Steps of Troubleshooting Process- Data Protection purposes.

UNIT – III

Fundamental Operating System: Purposes – Characteristics of Modern Operating Systems – Concepts–Comparisons, Limitations, and Compatibilities – Determination of Operating System based on Customer Needs – Installation of Operating System –Navigate a GUI (Windows) – Common Preventive Maintenance Techniques– Troubleshoot.

UNIT – IV

Fundamental Laptops and Portable Devices: Common Uses – Components of Laptop – Comparison of the components of Desktop and Laptops – Configure Laptops – Mobile Phone Standards – Preventive Maintenance Techniques - Troubleshoot Laptop and Portable Devices. Fundamental Printers and Scanners: Types of Printers and Scanners - Installation and Configuration Process of Printers and Scanners – Preventive Maintenance Techniques – Troubleshoot.

UNIT –V

Fundamental Networks: Principles – Types – Concepts and Technologies – Physical Components – LAN Topologies and Architectures– Standard Organizations – Ethernet Standards – OSI and TCP/IP Models – Configuration of NIC and Modem – Establishing Connectivity - Preventive Maintenance Techniques – Troubleshoot. Fundamental Security: Security Threats – Security Procedures - Preventive Maintenance Techniques – Troubleshoot Security.

TEXTBOOK

1. David Anfinson & Ken Quamme, "IT Essentials: PC Hardware and Software Companion Guide", 3rd Edition, Pearson Publications, 2008.

REFERENCE BOOK

1. Quentin Docter, Emmett Dulaneyand Toby Skandier, "CompTIA A+ Complete Review Guide: Exam 220-901, Exam 220 – 902", 3rd Edition, Wiley Publications, 2015.

NMEC-II : OFFICE AUTOMATION	
Course	**Offered to other department Students**
Effective from	2017 – 2018 Onwards
Semester	IV
NMEC	Non Major Elective Course
Hours: 2	**Credits: 2**

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: 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.

TEXT BOOK

1. Joyce Cox and Team, "Step by Step 2007 Microsoft Office System", PHI Learning Private limited, New Delhi, 2009.

REFERENCE BOOK

1. Peter Weverka, "MS Office 2013 All-in-One for Dummies", 1st Edition, Wiley Publications, 2013.

NMEC-II : BASICS OF INTERNET	
Course	**Offered to other department students**
Effective from	2017 – 2018 Onwards
Semester	IV
NMEC	Non Major Elective Course
Hours: 2	**Credits: 2**

UNIT -1

Introduction To The Internet: Computer in Business – Networking – Internet - E-mail – Resource Sharing – Gopher – World Wide Web – Telnet – Bulletin Board Service – Wide Area Information Service.

UNIT – II

Internet Technologies: Modem - Internet addressing – Physical connections – Telephone Lines – Internet browsers – Internet Explorer – Netscape Navigator.

UNIT - III

Introduction to HTML: Designing a home page – HTML documents – Anchor tag – Hyper Links.

UNIT – IV

Traditional text and formatting – tables - images - frames

UNIT - V

Case Study: Online Passport – Online Gas Services – Online Train Reservation – Tamilnadu government services

TEXTBOOKS

1. C Xavier, "World Wide Web with HTML", Tata McGraw Hill Education, 2000.
2. H.M.Deital, P.J. Deital, "Internet and World Wide Web – How to Program", 4th Edition "PHI Learning.

REFERENCE WEBSITES

1. http://www.ebharatgas.com/
2. http://passportindia.gov.in/
3. https://www.irctc.co.in
4. http://www.tn.gov.in/

SEMESTER I / III	Allied Paper – I : C PROGRAMMING	Credits : 3 Hours: 4

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 – Data types – Declaration of variables - Declaration of storage classes – Assigning values to variables-Defining symbolic constants. Operators and expression –Types of Operators –Arithmetic Expressions - Evaluation of expressions – Precedence of arithmetic operators – Type conversions in expressions – Operator precedence and associativity. 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.

TEXT BOOK

1. E. Balgurusamy, "Programming in ANSI C", 5th Edition, Tata McGraw Hill, New Delhi, 2010.

REFERENCE BOOKS

1. Herbert Schildt, **"**C: The complete Reference", 4th Edition, McGraw Hill, 2003.
2. B.L.Juneja, "Programming in C", 1st Edition, Cengage Learning, 2012.

Note :This paper should be handled and valued by Computer Science Department.

SEMESTER I / III	Allied Practical – I : PROGRAMMING IN C	Credits : 2 Hours: 3

C Practical Programming List:

1. Create a program to find the Simple Interest and Compound Interest.

2. Create a program to find the mean and standard deviation.

3. To find the largest of a given set of numbers.

4. Create a program to find the given number is Prime or not.

5. Create a program to calculate sin(x) using series.

6. Create a program to print the Fibonacci series.

7. Create a program to generate Pascal triangle.

8. Create a program to convert Binary to Decimal conversion.

9. Create a program to calculate binomial co-efficient using recursion.

10. Create a program to reverse a string without using string library function.

Note: For University Practical Exam, both Internal and External should be appointed from Department of Computer Science.

SEMESTER II / IV	Allied Paper – II : C++ PROGRAMMING	Credits : 3 Hours: 4

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

TEXT BOOK

1. E.Balagurusamy, "Object Oriented Programming with C++", 5th Edition, Tate McGraw Hill Publication Ltd., New Delhi, 2011.

REFERENCE BOOKS

1. M. T. Somashekara, " Object Oriented programming with C++", 2nd Edition, Prentice Hall of India Learning Limited, 2012.

2. Behrouz A.Forouzan, "A Structured Approach Using C++", 2nd Edition, Cengage Learning, 2003.

Note :This paper should be handled and valued by Computer Science Department.

SEMESTER II / IV	Allied Practical – II : PROGRAMMING IN C++	Credits : 2 Hours: 3

1. Write a C++ program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write member functions ADD(),SUB(), MUL(), DIV() to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.

2. Write a C++ program to create a class FLOAT that contains one float data member. Overload all the four Arithmetic operators so that they operate on the object FLOAT.

3. Write a C++ program to create a class STRING. Write a Member Function to initialize, get and display stings. Overload the operators ++ and == to concatenate two Strings and to compare two strings respectively.

4. Write a C++ program to create class, which consists of EMPLOYEE Detail like E_Number, E_Name, Department, Basic, Salary, Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.

5. Write a C++ program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS Calculate_Area() and Calculate_Perimeter() to calculate area and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGE from class Shape and Calculate Area and Perimeter of each class separately and display the result.

6. Write a C++ program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.

7. Write a program to convert an Infix Expression to Postfix Expression using Arrays.

8. Write a C++ program to create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the STACK. Write a member function PUSH() to insert an element and member function POP() to delete an element. Check for overflow and underflow conditions.

9. Write a C++ program to check whether the given string is a palindrome or not using Pointers.

10. Write a C++ program to merge two files into a single file

Note: For University Practical Exam, both Internal and External should be appointed from Department of Computer Science.

SEMESTER I / III	Allied Paper – I : DATABASE SYSTEMS	Credits : 3 Hours: 4

UNIT- I

Introduction to Databases – Introduction - Characteristics of the Database Approach -Advantages of Using the DBMS Approach -A Brief History of Database Applications.

UNIT- II

Database Systems Concept and Architecture : Data Models, Schemas, and Instances - Three Schema Architecture and Data Independence - Database Languages and Interfaces- - The Database System Environment - Centralized and Client/Server Architectures for DBMSs- Classification of Database Management Systems.

UNIT- III

The Relational Data Model and SQL - Database Constraints - Relational Model Concepts- Key concepts - Relational Model Constraints and Relational Database Schemas - Update Operations, Transactions, and Dealing with Constraint Violations.

UNIT- IV

Basic SQL - SQL Data Definition and Data Types - Specifying Constraints in SQL - Basic Retrieval Queries in SQL - INSERT, DELETE, and UPDATE Statements in SQL - Additional Features of SQL.

UNIT- V

More SQL: Complex Queries, Triggers, Views, and Schema Modification - More Complex SQL Retrieval Queries - Specifying Constraints as Assertions and Actions as Triggers -Views (Virtual Tables) in SQL.

TEXT BOOK

1. RamezElmasri and Shamkant B. Navathe, "Fundamentals of database systems",6thEdition, Addison-Wesley Publication, 2011.

REFERENCE BOOK

1. Raghu Ramakrishnan, Madison,Johannes Gehrke, "Database Management Systems", 3rd Edition, McGraw-Hill Higher Education, 2003.

Note: This paper should be handled and valued by Computer Science Department.

SEMESTER I / III	Allied Practical – I : MS-ACCESS	Credits : 2 Hours: 3

1. Create a database for a company and create a table for employee. Add fields emp_no, name, qualification, DOJ, designation and salary for employee table. And save the table in the database.

2. Create another table for customer and add fields cust_no, name, date_of_purchase, products, quantity, and price and save in the same company database.

3. Create table for personal information and Add at least 10 records for the table with the following fields no, name, DOB, address, ph_no, email_id, and blood group.

4. Create a new table for students and do table manipulations by Adding, deleting, and updating fields to the table.

5. Calculate the sum, average and assign the grade in the student table.

6. Display the students name in ascending and descending order after sorting.

7. Create a home budget table for calculate expenses of house for 4 months with the following fields month , house rent , EB , telephone bill, milk, grocery, vegetables, medical_exp ,total_exp

      i)   find out the month on which the budget is high

      ii)   List out all grocery expenses for all the months.

      iii)   Find out the month on which the telephone bill is low.

      iv)   Any other relevant filters.

8. For the employee table execute the following queries.

      i)   List the manager name under each department using GROUP BY.

      ii)   List the employees whose salary is greater than 10000 and less than 20000.

      iii)   List out the employee details who is in morning shift.

9. Display the information of home budget table using columnar and tabular form.

10. Generate the report for any one of the above said tables.

Note: For University Practical Exam, both Internal and External should be appointed from Department of Computer Science.

SEMESTER II / IV	Allied Paper – II : E – COMMERCE TECHNIQUES	Credits : 3 Hours: 4

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 Corporate. 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-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. Information systems for Mobile Commerce: Introduction – Wireless Applications – Cellular Network – Wireless Spectrum – Technologies for Mobile Commerce – Wireless Technologies

UNIT- IV:

HTML and Web Designing: Brief History of HTML – HTML Tags – Table Creation – Hyperlink – Reference – Headings – Alignment - Simple Web Page Creation.

UNIT- V:

E-mail: Email – Email Components - use of Email–Email creation–browsing–search engines–downloads.

TEXT BOOKS

1. P.T.Joseph, "E-Commerce - An Indian Perspective", 4th Edition, PHI Learning, 2012.

2. C Xavier, "World Wide Web Design with HTML", 13th Reprint, Tata McGraw Hill, 2006.

3. A.Leon and M.Leon, "Introduction to Information Technology", 1stEdition, Vijay Nicole Publications, 2013.

REFERENCE BOOKS

1. David Whiteley, "E-Commerce Strategy, Technologies and Applications", 1st Edition, Tata Mc-Graw-Hill, 2001.

2. Kamalesh K Bajaj and Debjani Nag, "E-Commerce – The cutting edge of Business", 2nd Edition, Tata McGraw-Hill Education, 2005.

3. Alexis Leon and Mathews Leon, "Internet for Everyone", 15th Anniversary Edition, Leon Tech world, UBS Publications, 2012.

4. Ritendra Goel, "e-commerce", New Age International Publishers, 2016.

Note: This paper should be handled and valued by Computer Science Department.

SEMESTER II / IV	Allied Practical – II : HTML PROGRAMMING	Credits : 2 Hours: 3

1. Write HTML code to develop a web page that contains the different background and foreground color, with various styles.

2. Write HTML code to create a Webpage 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. Create a student mark list in HTML using Tables.

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SEMESTER I / III	Allied Paper – I : COMPUTER APPLICATIONS IN OFFICE	Credits : 3 Hours: 4

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.

TEXT BOOKS:

1. Alex Leon, Mathew Leon,"Introduction to Computers", Vikas Publishing, 2008.

2. Diane Koers, "Microsoft Office XP - fast & easy", Prentice Hall of India Private Limited, New Delhi, 2001

REFERENCE BOOKS

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

2. Peter Weverka, "MS Office 2013 All-in-One for Dummies", 1st Edition, Wiley Publications, 2013.

Note: This paper should be handled and valued by Computer Science Department.

SEMESTER I / III	Allied Practical – I : OFFICE AUTOMATION	Credits : 2 Hours: 3

Word Processor
1. i) Create a document, save it and edit the document as follows:
    a. Cut, Copy, Paste options.
    b. Find and Replace options.
    c. Undo and Redo options.
   ii) Format the document:
    a. Using Bold, Underline and Italic.
    b. Change Character style and size.
    c. Formatting paragraph: Center, Left aligns & Right align
    d. Changing paragraph and line spacing, Using Bullets and Numbering in Paragraphs.
    e. Creating Hanging Paragraphs

2. Enhance the documents using Header, Footer, Page Setup, Border, Page number, watermarking, Orientation and Print Preview.

3. Insert tables and pictures in a document as follows
    f. Creating Tables in a document, Selecting Rows & Column sort the record
    g. Insert a picture – edit size and add name of the picture above it.
    h. Also do basic text formatting like – bold, italic, underline, alignments etc in table.,

4. Using mail merge, send an invitation /notice (by creating the invitation/notice) for the following situation (at least 5 addresses to be entered) (Any one of the following)
    i. For opening a new branch
    j. Inauguration function
    k. Informing about new scheme or offer

Spreadsheet
5. a. Create a worksheet, moving/ copying/ inserting/ deleting rows and columns (usage of cut, paste, commands, copying a single cell, copying a range of data, filling up a cell. Undo command, inserting a row, column, deleting rows and columns).

   b. Formatting worksheets
       Bold, Italic, Font size changing, Auto fill, date format, Currency format

6. Open an excel and create fields as follows

S.No	Name of the student	M1	M2	M3	M4	M5	Total	Avg	Result	Grade

   i. Enter S.No, Name, marks for 10 students
   ii. Find total and average using formula.
   iii. Find Result whether the student is pass or fail and also assign grade as per our university norms.

iv. Insert a column chart showing the comparison of marks in different subjects of different students.

7. i) Creating and running a macro.
   ii) Assigning button to a defined macro.
   iii) Editing a macro.

Presentation

8. Create a presentation with apply background/Themes, apply custom animation on text, insert images/word art and animate the images with effects.

9. Create "My album" use photos, audio, and videos with necessary Transition Effects

10. Making an Organization Structure in Power Point
    Starting an organization chart, Entering names and Titles, Adding Members, Formatting the Boxes, Text and Lines, Rearranging the Org Chart, Finishing the Chart

Note: For University Practical Exam, both Internal and External should be appointed from Department of Computer Science.

SEMESTER II / IV	Allied Paper – II : IMAGE EDITING TOOL	Credits : 3 Hours: 4

UNIT-1

Getting Started with Photoshop CS5: Launching Photoshop CS5 - Exploring the Interface - Using Screen Modes - Opening an Existing Image - Opening an Image Using Adobe Bridge - Exploring Commonly Used Tools in the Tools Panel - Creating a New Document - Saving a Document - Reverting a Document - Selecting a Workspace - Creating a New Workspace - Deleting a Workspace - Working with Panels in Photoshop CS5 - Keyboard Shortcuts and Menu Settings - Customizing Preferences.

UNIT-2

Working with Images: Differences between Bitmap and Vector Images - Understanding Image Resolution Editing Images - Different Color Modes in Photoshop CS5 - Making Color Adjustments - File Formats in Photoshop CS5 -Creating a PDF File in Photoshop CS5 - Importing a PDF File into Photoshop CS5 - Making a Selection with Selections Tools - Modifying a Selection- Transforming a Selection - Transforming Pixels.

UNIT-3

Mastering Layers in Photoshop CS5: Exploring LAYERS Panel - Working with Layers -Organizing Layers Working with Opacity and Blend Modes - Working with Adjustment Layers - Masking in Photoshop CS5 - Setting the Current Foreground and Background Colors - Filling a Selection with the Current Foreground Color - Using the Content-Aware Feature - Exploring Drawing Tools - Exploring Painting Tools - Exploring Retouching Tools.

UNIT-4

Working with Layer Styles and Filter Effects: Understanding Layer Styles - Working with Smart Objects - Understanding Filters.

UNIT-5

Animation, 3D, and Printing in Photoshop CS5: Working with Actions - Working with Automate Commands - Exploring 3D in Photoshop - Working with Animation in Photoshop CS5 - Printing in Photoshop CS5.

TEXT BOOK

1. Kogent Learning Solutions Inc, "Photoshop CS5 in Simple Steps", Dreamtech Press, New Delhi, 2012.

REFERENCE BOOKS

1. Brie Gyncild, "Adobe Photoshop CS6 Classroom in a Book", Adobe Press/Peachpit, 2012

2. Lisa Danae Dayley, Brad Dayley , "Adobe Photoshop Cs6 Bible", Wiley India Pvt Ltd.

3. Edward Bailey, "Photoshop: 7 Ways to Use Adobe Photoshop Like a Pro", Create space Independent Publishing Platform

Note: This paper should be handled and Valued by Computer Science Department.

SEMESTER II / IV	**Allied Practical – II :** **IMAGE EDITING SOFTWARE**	**Credits : 2** **Hours: 3**

1. Design a greeting card for birthday using different text effects.
2. Apply various filter effects to an image.
3. Design the front page of the college calendar using gradient.
4. Create a pattern using pattern stamp tool and clone stamp tool.
5. Design a web page layout.
6. Design a bunch of flowers.
7. Create Plastic Surgery for the Nose
8. Create See-through texts
9. Convert Black and White Photo to Color Photo
10. Fill a text with an appropriate image (Ex: Write Flower and fill it with some flower images)

Note: For University Practical Exam, both Internal and External should be appointed from Department of Computer Science.

SEMESTER I / III	Allied Paper – I : PHP SCRIPTING LANGUAGE	Credits : 3 Hours: 4

UNIT – I

Basic of Coding in PHP: Mixing PHP and HTML – Introducing Variables and Operators – PHP Variables.

UNIT – II

Displaying Dynamic Content – Sending E-Mail – Using File System – Uploading Files to Website**.**

UNIT – III

Establishing a connection – Creating a Database Table – Inserting Data into the Table – Selecting and Displaying Data.

UNIT – IV

System Planning - Adding Contacts Modifying Contacts - Deleting Contacts - Working with Contacts.

UNIT – V

Managing a Simple Mailing List**:** Mailing List Software – Developing Subscription Mechanism, Mailing Mechanism. Creating Custom Logs and Reports.

TEXTBOOK

1. Julie Meloni and Matt Telles, "PHP 6", 3rd Edition, Cengage Learning India Edition, 2009.

REFERENCE BOOKS

1. Julie Meloni and Matt Telles, "PHP 6 Fast and Easy Web Development", 1st Edition, Cengage Learning India Edition, 2008.
2. Steven Holzner, "The Complete Reference PHP", Indian Edition, McGrawHill Education, 2007.

Note: This paper should be handled and valued by Computer Science Department.

SEMESTER I / III	Allied Practical – I : PHP PROGRAMMING	Credits : 2 Hours: 3

1. Write a PHP program to find the factorial of a number using forms.

2. Write a PHP program to design a login form using Conditional Statements.

3. Write a PHP program to design a visiting card.

4. Design a simple web page to generate multiplication table for a given number using PHP.

5. Design a web page that should compute one's age on a given date using PHP.

6. Write a PHP program to download a file from the server.

7. Write a PHP program to store the current date and time in a COOKIE and display 'Last Visited' date and time on the web page.

8. Write a PHP program to store page views count in SESSION, to increment count on each refresh and to show the count on web page.

9. Write a PHP program to design a calendar for the current year.

10. Write a PHP Program to create a time table for the current semester.

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SEMESTER II / IV	Allied Paper – II : BASICS OF COMPUTER AND FINANCIAL COMPUTING	Credits : 3 Hours: 4

UNIT – I

Introduction to Computers – Classification of Digital Computer Systems – Anatomy of a Digital Computer – Memory Units – Input Devices – Output Devices – Auxiliary Storage Devices.

UNIT-II

Computer Software – Programming Languages – Operating Systems – Computer Networks – Internet – Electronic Mail.

UNIT-III

Introduction to Tally – Company Creation – Alter – Display – Accounts info – Ledger Creation – Voucher Creation – Bank Reconciliation Statement – Bill wise Details – Cost Centre and Cost Category – Multi Currency – Interest calculation – Budgets and Credit Limits – Day Book.

UNIT-IV

Inventory info – Stock Group – Stock Category – Stock Item – Unit of Measures – Godowns – Inventory vouchers – Re-order level and status – Batch-wise Details – Bill of Material.

UNIT-V

Statutory and Taxation – Value Added Tax (VAT) – Tax Deducted at Source (TDS) – Tax Collected at Source (TCS) – Service Tax – Security Control and Tally audit – Export and Import – Backup and Restore – Open Database Connectivity.

TEXTBOOKS

1. Alex Leon, Mathew's Leon, "Fundamentals of Computer Science and Communication Engineering", Vikas Publishing House, New Delhi, 1998.
2. A complete Reference - "Tally 9.0", Tally Solutions (P) Limited

REFERENCE BOOK

1. Dr.Namrata Agrawal, "Comdex Tally 9 Course Kit", Dreamtech Publications,New Delhi,2010.
2. Ritendraq Goel, D N Kakkar, "Computer Applications in Management", New Age International Publishers, 1st Edition Reprint 2008.

Note: This paper should be handled and Valued by Computer Science Department.

SEMESTER II / IV	Allied Practical – II : FINANCIAL COMPUTING SOFTWARE	Credits : 2 Hours: 3

1. Company Information

    a. Company creation

    b. Select Company

    c. Alter Company

    d. Split Company Data

2. Gateway of Tally

    a. Accounts info

        i) Groups

        ii) Ledgers

        iii) Voucher Types

    b. Inventory info

        i) Stock Group

        ii) Stock Category

        iii) Stock item

        iv) Unit of Measures

        v) Godown

    c. Accounting Vouchers

        d. Inventory Vouchers

3. Statutory and Taxation

    a. Value Added Tax (VAT)

    b. Tax Deducted at Source (TDS)

    c. Tax Collected at Source (TCS)

    d. Service Tax

4. Display

      a. Trial Balance

      b. Day Book

      c. Accounts Book

      d. Statement of Accounts

      e. Inventory Books

      f. Statement of Inventory

Note: For University Practical Exam, both Internal and External should be appointed from Department of Computer Science.