Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)

Department of Computer Applications

BACHELOR OF COMPUTER APPLICATIONS Under CBCS

Course Structure and Scheme of Examination w.e.f 2020-21

I Semester

Paper Code	Course	Teaching Hours	Sem End Exam	Mid Sem Exam*	Total Marks	Credits
BCA1.1.1	First Language-English-I	4	75	25	100	3
BCA1.1.2	Second Language-Hindi/Sanskrit-I	4	75	25	100	3
BCA1.1.3	Life Skill Course – I (Human Values & Professional Ethics)	2	50	0	50	2
BCA1.1.4	Skill Development Course – I (Plant Nursery)	2	50	0	50	2
BCA1.1.5	Computer Fundamentals & MS office	4	75	25	100	4
BCA1.1.6	Computer Fundamentals & MS office Lab	2	50	0	50	1
BCA1.1.7	Programming Using “C”	4	75	25	100	4
BCA1.1.8	Programming Using “C” Lab	2	50	0	50	1
BCA1.1.9	Numerical and Statistical Methods	4	75	25	100	4
BCA1.1.10	Numerical and Statistical Methods Lab	2	50	0	50	1
Total		**30**	**625**	**125**	**750**	**25**

II Semester

Paper Code	Course	Teaching Hours	Sem End Exam	Mid Sem Exam*	Total Marks	Credits
BCA1.2.1	First Language-English-II	4	75	25	100	3
BCA1.2.2	Second Language-Hindi/Sanskrit-II	4	75	25	100	3
BCA1.2.3	Life Skill Course – II	2	50	0	50	2
BCA1.2.4	Life Skill Course – III	2	50	0	50	2
BCA1.2.5	Skill Development Course – II	2	50	0	50	2
BCA1.2.6	Skill Development Course – III	2	50	0	50	2
BCA1.2.7	Data Structures	4	75	25	100	4
BCA1.2.8	Data Structures Lab	2	50	0	50	1
BCA1.2.9	Database Management Systems	4	75	25	100	4
BCA1.2.10	Database Management Systems Lab	2	50	0	50	1
BCA1.2.11	Accounting and Financial Management	4	75	25	100	4
BCA1.2.12	Accounting and Financial Management Lab	2	50	0	50	1
Total		**34**	**725**	**125**	**850**	**29**

III Semester

Paper Code	Course	Teaching Hours	Sem End Exam	Mid Sem Exam*	Total Marks	Credits
BCA2.1.1	First Language-English-III	4	75	25	100	3
BCA2.1.2	Second Language-Hindi/Sanskrit -III	4	75	25	100	3
BCA2.1.3	Life Skill Course – IV	2	50	0	50	2
BCA2.1.4	Skill Development Course – IV	2	50	0	50	2
BCA2.1.5	Object Oriented Programming Through Java	4	75	25	100	4
BCA2.1.6	Object Oriented Programming Through Java Lab	2	50	0	50	1
BCA2.1.7	Operating Systems	4	75	25	100	4
BCA2.1.8	Operating Systems Lab	2	50	0	50	1
BCA2.1.9	Statistical Methods & their Applications	4	75	25	100	4
BCA2.1.10	Statistical Methods & their Applications Lab	2	50	0	50	1
Total		**30**	**625**	**125**	**750**	**25**

IV Semester

Paper Code	Course	Teaching Hours	Sem End Exam	Mid Sem Exam*	Total Marks	Credits
BCA2.2.1	Cryptography	4	75	25	100	4
BCA2.2.2	Cryptography Lab	2	50	0	50	1
BCA2.2.3	Data Mining & Data Ware Housing	4	75	25	100	4
BCA2.2.4	Data Mining & Data Ware Housing Lab	2	50	0	50	1
BCA2.2.5	Web Programming	4	75	25	100	4
BCA2.2.6	Web Programming Lab	2	50	0	50	1
BCA2.2.7	Unix	4	75	25	100	4
BCA2.2.8	Unix Lab	2	50	0	50	1
BCA2.2.9	Data Analytics using R	4	75	25	100	4
BCA2.2.10	Data Analytics using R Lab	2	50	0	50	1
BCA2.2.11	Object Oriented Software Engineering	4	75	25	100	4
BCA2.2.12	Object Oriented Software Engineering Lab	2	50	0	50	1
Total		**36**	**750**	**150**	**900**	**30**

V Semester

Paper Code	Course	Teaching Hours	Sem End Exam	Mid Sem Exam*	Total Marks	Credits
BCA3.1.1	Networks	4	75	25	100	4
BCA3.1.2	Networks Lab	2	50	0	50	1
BCA3.1.3	Android Programming	4	75	25	100	4
BCA3.1.4	Android Programming Lab	2	50	0	50	1
BCA3.1.5	Artificial Intelligence	4	75	25	100	4
BCA3.1.6	Artificial Intelligence Lab	2	50	0	50	1
BCA3.1.7	**Elective-I [Theory]:** Python PHP	4	75	25	100	4
BCA3.1.8	**Elective-I [Lab]:** Python Lab PHP Lab	2	50	0	50	1
BCA3.1.9	**Elective-II [Theory]:** Principles of Animation Computer Graphics	4	75	25	100	4
BCA3.1.10	**Elective-II [Lab]:** Principles of Animation Lab Computer Graphics Lab	2	50	0	50	1
BCA3.1.11	**Elective-III [Theory]:** Cloud Computing Mobile Computing	4	75	25	100	4
BCA3.1.12	**Elective-III [Lab]:** Cloud Computing Lab Mobile Computing Lab	2	50	0	50	1
Total		**36**	**750**	**150**	**900**	**30**

VI Semester

Paper Code	Course	Teaching Hours	Sem End Exam	Mid Sem Exam*	Total Marks	Credits
BCA3.2.1	FIRST and SECOND PHASES (2 spells) of APPRENTICESHIP between 1st and 2nd year and between 2nd and 3rd year (two summer vacations).				APPRENTICE SHIP between 1st and 2nd year (1Spell)	4
BCA3.2.2	THIRD PHASE of APPRENTICESHIP Entire 5th / 6th Semester				APPRENTICE SHIP between 2nd and 3rd year (2Spell)	4
BCA3.2.3	**Main Project**					12
Total		**--**	**--**	**--**	**--**	**20**
Grand Total		**166**	**3475**	**675**	**4150**	**159**

BACHELOR OF COMPUTER APPLICATIONS

Syllabus

with effect from 2020-21 admitted batch

Chairman

Board of Studies

(2020-21)

Department of Computer Applications
Gayatri Vidya Parishad College for Degree and PG Courses (A)
(Affiliated to Andhra University)
Visakhapatnam

BACHELOR OF COMPUTER APPLICATIONS

Syllabi

With effect from 2020-21 admitted batch

I YEAR I SEMESTER

Paper Code	Course	Teaching Hours	Sem End Exam	Mid Sem Exam*	Total Marks	Credits
BCA1.1.1	First Language-English-I	4	75	25	100	3
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BCA1.1.10	Numerical and Statistical Methods Lab	2	50	0	50	1
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Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester I

COMPUTER FUNDAMENTALS AND MS OFFICE

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:

1. To introduce the concepts of computer fundamentals and their applications for the efficient use of office technology in a business environment.
2. To introduce the fundamentals of computing devices and reinforce computer vocabulary, particularly with respect to personal use of computer hardware and software.
3. To provide hands-on use of Word, Excel and PowerPoint.

SYLLABUS

UNIT I:

Introduction to computers: Definition of computer, Characteristics and limitations of computer, Block diagram of computer, types of computers, uses of computers, computer generations, Input devices and output devices: Keyboard and mouse, inputting data in other ways

UNIT II:

Memories: primary, secondary and cache memory, **Types of Software:** system software, Application software, commercial software, open-source software, domain software and free ware software, **Programming Languages**: Introduction to Programming Languages – Generations of Programming Languages

UNIT III:

MS-Word: Features of MS-Word, MS-Word Window components, creating, saving and opening documents, **Formatting documents:** Selecting text, formatting characters, changing cases, Paragraph formatting, Bullets & numbering, **editing text:** Copying & moving data, Finding & replacing text, Reversing actions (undo). Header & footer, **Working with Tables:** Definition, inserting tables, inserting & deleting rows and columns. **Working with Graphics:** Inserting pictures, inserting shapes, inserting clipart images. Mail merging, Printing documents.

UNIT IV:

MS-Excel: Excel Features, MS-Excel window components, Worksheets, rows, columns, cells. **Worksheet basics:** Workbooks, Creating a new workbook, Opening a Workbook, Saving a Workbook, Entering labels, values, and formulas in worksheet, Inserting rows and columns, Deleting rows and columns, **Formatting Options:** Adjusting row height and column width - Formatting cell values, **Formulas:** operators used in formula, cell references in formula, **Functions:** Definition, Inserting a function in Excel, Types of functions in Excel: Mathematical, Statistical, Logical, Text, **Working with Charts:** Different types of charts, Creating a chart, Parts of chart

UNIT V:		
Microsoft PowerPoint: PowerPoint features, MS-PowerPoint window components, creating a presentation, saving presentation and opening presentation, **working with slides:** Inserting, deleting, copying slides, editing text, formatting text, **Formatting and Modifying Presentations**: Applying transition and animation to the slides, inserting music or sound on a slide, viewing slide show		
Outcomes:		
1 Describe the usage of computers and why computers are essential components in business and society. 2. Identify categories of programs, system software and applications. Organize and work with files and folders. 3. Compose, format and edit a word document and working with macros. 4. Create work sheets and using various functions. 5. Make presentations and inserting multimedia in them.		
References:		
1. Rajaraman, Introduction to Information Technology, PHI 2. Introduction to Computers – Peter Norton Mcgraw Hill. 3. Microsoft Excel 2007, Custom Guide Inc, 2007		
Text Books:		
1. Computer Fundamentals – Pradeep. K.Sinha: BPB Publications. 2. Fundamentals of Computers by Reema Thareja from Oxford University Press 3. Microsoft Office 2007 Fundamentals, 1st Edition By Laura Story, Dawna Walls		

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications
B.C.A-Semester I
COMPUTER FUNDAMENTALS AND MS OFFICE LAB

Credits: 1	Lab: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives:

1. To Create a document in Microsoft Word with formatting
2. To Write functions in Microsoft Excel to perform basic calculations and to convert number to text and text to number
3. To create a presentation in Microsoft PowerPoint that is interactive and legible content.

SYLLABUS

MS-WORD

1. Prepare a document in to design a visiting card
2. Prepare a document to design front page of a text book
3. Prepare a document to illustrate headers and footers
4. Prepare a Call Letter for All Applicants to inform interview Details using mail merge

MS-EXCEL

5. Create an excel sheet to show time table of your class
6. Create a pay slip with details of employee salary
7. Create an excel sheet for student result and grades calculation
8. Prepare an excel sheet for creating a pie chart for budget analysis
9. Prepare an excel sheet to illustrate various functions

MS-POWERPOINT

10. Prepare a presentation about your college
11. Prepare a presentation about Olympic games
12. Prepare a presentation about your country / state / place

Outcomes:

1. Student will get knowledge the basic technicalities of creating Word documents for office use.
2. Student will get knowledge Create and design a spreadsheet for general office
3. Student will get knowledge the basic technicalities of creating a PowerPoint presentation.
4. Student will get knowledge the practices in data & files management
5. Student will create formulas in excel sheet.

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications
B.C.A-Semester I
PROGRAMMING USING C

Credits: 4	**Theory: 4 Hours**	**Tutorials: -**
Max Marks: 100	**External: 75 Marks**	**Internal: 25 Marks**

Course Objectives:

1. Provides knowledge on Algorithms, Flow chart and different programming languages.
2. To train the students with basic concepts of programming using C.
3. Provides complete knowledge of C language.
4. Helps to develop logics which will help them to create program and applications in C.
5. Learning the basic programming constructs, they can easily switch over to any other language in future.

SYLLABUS

UNIT I:

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms, Flow Charts, Programming Languages – Generations of Programming Languages

Introduction to C: Introduction – Structure of C Program – Writing the first C Program – Files used in C Program – Compiling and Executing C Programs - Programming Example

UNIT II:

C Fundamentals: Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Operators in C – I/O Statements (scanf, printf)

Decision Control Statements: Introduction to Decision Control Statements – Conditional Branching Statements: simple if, if..else, nested if, switch statements – Programming Examples

UNIT III:

Iterative Control Statements: Iterative Statements – Nested Loops – Break and Continue Statement - Goto Statement

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array – one dimensional array for inter-function communication – Two dimensional Arrays – two dimensional arrays for inter-function communication

Strings: Introduction – String operations – String functions

UNIT IV:

Functions: Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions.

Structure and Unions: Introduction – Nested Structures – Arrays of Structures – Structures and Functions – Unions – Arrays of Unions Variables

UNIT V:

Pointers: Introduction to Pointers – declaring Pointer Variables – Passing Arguments to Functions using Pointer – Pointer and Arrays – Dynamic Memory Allocation

File Handling: Introduction to Files, File modes, File operations, Reading Data from Files, Writing Data from Files, Detecting the End-of-file

Outcomes:

Upon successful completion of this course, students will be able to-

1. Understand the basic terminology used in computer programming.
2. Write, compile and debug programs in C language.
3. Use different data types in a computer program.
4. Design programs involving decision structures, loops and functions.
5. Understand the dynamics of memory by the use of pointers and Structures.
6. Apply different operations in File handling.

References:		
1. E Balagurusamy: Computing Fundamentals & C Programming – Tata McGraw-Hill, Second Reprint 2008, ISBN 978-0-07-066909-3. 2. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publ, 2002. 3. Yashavant Kanetkar - Let Us 'C' – BPB Publications. 4. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language - Pearson publications.		
Text Books:		
Computer Fundamentals and Programming in C by Reema Thareja from Oxford University Press		

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester I

PROGRAMMING USING C LAB

Credits: 1	Lab: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives:

1. To implement decision making and arrays.
2. To develop programs for pointers and structures.
3. To write C programs using Files.

SYLLABUS

1. Write a C program to calculate the expression: ((a*b)/c)+(a+b-c) .
2. Write a C program to calculate $(a+b+c)^3$.
3. Write a C program to check whether the given number is Prime or Not.
4. Write a C program to find the sum of individual digits of a given number .
5. Program to convert Hours into seconds.
6. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
7. Write a program to check whether given number is Palindrome or Not.
8. Write a C program to check whether a given 3-digit number is Armstrong number or not.
9. Write a C program to print the numbers in triangular form.

```
1

1 2

1 2 3

1 2 3 4
```

10. Program to display number of days in given month using Switch – Case.
11. Write a C program to perform the following:
    i. Addition of two matrices.
    ii. Multiplication of two matrices.
12. Write a C program to determine if the given string is a palindrome or not.
13. Write C program to find the factorial of a given integer using recursive function.
14. Write a C program to concatenate two strings using pointers.
15. Write a C program to find the length of string using pointers.
16. Program to display Student Details using Structures.
17. Write a C program to
    iii. Write data into a File.
    iv. Read data from a File.

Outcomes:

After Completion of the course student should able to

1. Student will be able to Know concepts in problem solving.
2. Ability to do programming in C language.
3.To write diversified solutions using C language.
4. ability to write programming with pointers and structures.
5. Ability to write c programming with files.

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester I

NUMERICAL AND STATISTICAL METHODS

Credits: 4	**Theory: 4 HOURS**	**TUTORIALS: -**
Max Marks: 100	**External: 75 Marks**	**Internal: 25**

Course Objectives:

1. To learn how to perform error analysis for arithmetic operations.
2. To demonstrate working of various numerical methods and matrix methods
3. To provide a basic understanding of the derivation and use of methods of interpolation and numerical integration.
4. To impart knowledge of various statistical techniques.
5. To develop students understanding through laboratory activities to solve problems related to above stated concepts.

	SYLLABUS	
Unit I:		

Numerical Integration, Finite Difference and Interpolation

Numerical Integration:

1. Trapezoidal rule 2. Simpson's 1/3 rule 3. Simpson's 3/8 rule

Finite Difference and Interpolation:

Finite Differences - Forward Differences - Backward differences.

Newton's forward interpolation formula - Newton's backward interpolation formula

Unit II:		

Matrix Algebra

Matrix Algebra: Types of matrices -Matrix addition and subtraction - Matrix Multiplication- Transpose of a matrix, row matrix, column matrix, Symmetric and skew symmetric matrices.

Unit III:		

Linear Equations

Ad joint of a square matrix- Inverse of square matrix by using Adj A 3 order only and Rank of a Matrix.

Solution of Linear Equations

Cramer's Rule

Matrix Inverse method

Statistical Methods

Unit IV:		

Basic concepts and definition of statistics: measures of central tendency, Mean, Median and Mode, Standard deviation, coefficient of variation Skewness, Karl pearson's coefficient of skewness, Bowley's Coefficient of skewness,

Unit V:		

Correlation: Karl Pearson correlation coefficient, Rank correlation and illustrated examples.

Probability: Basic concepts and definition of probability, probability axioms, conditional probability, addition and multiplication theorem of probability (Based on set theory concepts), Only Statements, Problems and applications.

Note: 1. Concentration on numerical problems only.

2. Proofs of theorems and Derivations of expressions are omitted.

Outcomes:		
1. Skill to choose and apply appropriate numerical methods to obtain appropriate solutions to difficult mathematical problems. 2. Ability to apply various statistical techniques such as Measures of Central Tendency and Dispersion. 3. Skill to execute programs of various Numerical Methods and Statistical techniques for solving mathematical problems. 4. Ability to find the solution of algebraic and transcendental equations. 5. Familiarize with Newton's backward and forward interpolation formulae.		
Text Books:		
1. Mathematical Methods by Dr.T.K.V. Iyengar, Dr.B.Krishna Gandhi, Dr. S.Ranganatham, and Dr.M.V.S.S.N. Prasad by S.Chand publications 6th revised edition 2011. 2. Quantitative Techniques by C.Satyadevi by S.Chand Company		
References:		
1. Higher Engineering Mathematics by Dr.B.S.Grewal by Karna publisher‟s 34th edition. 2. Statistical Methods – Snedecor G.W. & Cochran W.G. Oxford & + DII. 3. Elements of Statistics – Mode. E.B. - Prentice Hall. 4. Statistical Methods – Dr. S.P. Gupta – Chand & Sons.		

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester I

NUMERICAL AND STATISTICAL METHODS LAB

Credits: 1	**Lab: 2 Hours**	**Tutorials: -**
Max Marks: 50	**External: 50 Marks**	**Internal:**

Course Objectives:

1. This lab course will provide opportunity to the learners to implement the concepts and techniques learned in Numerical and Statistical Techniques course in C/C++ Language and/or in MS-Excel

SYLLABUS

1. Problem on Trapezoidal rule.
2. Problem on Simpsons 1/3rd rule.
3. Problem on Simpsons 3/8rd rule.
4. Forward and backward difference Tables.
5. Problem on Newton's forwards interpolation formula.
6. Problem on Newton's backward interpolation formula.
7. Problem on Matrix addition, Subtraction and multiplications.
8. Problems on Symmetric and Skew Symmetric Matrices.
9. To find adjoint of a square Matrices.
10. To find Inverse of a Square Matrices.
11. Solution of linear equations by Cramer and Inverse Methods.
12. To find Mean, Median and Mode for grouped data.
13. To find Standard deviation.
14. To find correlation.
15. To find rank correlation.

Outcomes:

After Completion of the course student should able to
1. Student will be able to Know concepts in problem solving.
2. Ability to do programming in C language.
3.To write diversified solutions using C language.
4. ability to write programming with pointers and structures.
5. Ability to write c programming with files.

Syllabi

With effect from 2020-21 admitted batch

I YEAR II SEMESTER

Paper Code	Course	Teaching Hours	Sem End Exam	Mid Sem Exam*	Total Marks	Credits
BCA1.2.1	First Language-English-II	4	75	25	100	3
BCA1.2.2	Second Language-Hindi/Sanskrit-II	4	75	25	100	3
BCA1.2.3	Life Skill Course – II	2	50	0	50	2
BCA1.2.4	Life Skill Course – III	2	50	0	50	2
BCA1.2.5	Skill Development Course – II	2	50	0	50	2
BCA1.2.6	Skill Development Course – III	2	50	0	50	2
BCA1.2.7	Data Structures	4	75	25	100	4
BCA1.2.8	Data Structures Lab	2	50	0	50	1
BCA1.2.9	Database Management Systems	4	75	25	100	4
BCA1.2.10	Database Management Systems Lab	2	50	0	50	1
BCA1.2.11	Accounting and Financial Management	4	75	25	100	4
BCA1.2.12	Accounting and Financial Management Lab	2	50	0	50	1
Total		**34**	**725**	**125**	**850**	**29**

Department of Computer Applications
B.C.A-Semester II
DATA STRUCTURES

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:

1. The objective of the course is to make a student to implement data structures and organize data based on data structures for efficient access.

	SYLLABUS	
UNIT I:		

Introduction to Data Structure: Definition, Data Types, Abstract Data Types (ADT), classification of data structure - primitive & non-primitive data structures, Linear and Non-linear data structures
Arrays: Definition, one dimensional array, two dimensional arrays, Applications, pointers.
Linked List: Definition, linked list ADT, single linked list, double linked list, circular linked list, comparison of linked list with Arrays.

UNIT II:		

STACKS: Definition, Stack as an ADT & Operations on stack, Applications of stack, Representation of stack.
QUEUES: Definition, Queue as an ADT & Operations on Queue, Application of Queues, Representation of Queues, Various Queue Structures: circular Queue, DE Queue.

UNIT III:		

TREES: Definition, Basic Tree Terminology. **Binary Tree** – Definition, Properties of Binary Trees, Types of Binary Trees, Representation of Binary Tree, Binary Tree Traversals.
Binary Search Tree (BST) – Definition, Operations on a Binary Search Tree, Examples of BST.

UNIT IV:		

GRAPHS: Definition, Basic Graph Terminology, Representation of Graphs, Graph Traversal – DFS and BFS. Topological sort, Shortest Path problem, Minimum Spanning Tree.

UNIT V:		

SORTING: Definition, Sorting methods - Bubble Sort, Selection Sort, Quick Sort, Insertion Sort, and Merge Sort.**SEARCHING**: Definition, searching methods - Linear or Sequential Search, Binary Search.

Outcomes:		

1. Identify data structures suitable to solve problems.
2. Developing algorithms.
3. Identifying the use of Time and Space Complexity.
4. Implementing different sorting & searching techniques.

References:		

1. Data structures by Lipschutz, McGraw Hill Education
2. Fundamentals of Data Structures in C by Sahni Horowitz, University Press
3. Data Structures and Algorithms by Alfred V Aho and John E Hopcroft and Jeffrey D Ullman, Pearson Education
4. **"Data Structures through C", Yashavant Kanetkar, BPB Publications**

Text Books:

1. "Classic Data Structures", by Debasis samantha 2nd edition, phi publications, 2009
2. "Data structures and algorithms", by Narasimha karumanchi , careermonk publications , 2017

B.C.A-Semester II

DATA STRUCTURES LAB

Credits: 1	Lab: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives: The course is designed to develop skills to design and analyze and implement simple linear and non - linear data structures in java. It strengthens the ability to the students to identify and apply the suitable data structure for the given real-world problem. It enables them to gain knowledge in practical applications of data structures.

SYLLABUS

1. Program to generate Fibonacci series using recursion
2. Program for implementation of stack using arrays.
3. Program for implementation stack using linked list.
4. Program for implementation queue using array.
5. Program for implementation queue using linked list.
6. Program for implementation of circular queue.
7. Program for linear searching.
8. Program for binary searching.
9. Program for Binary search tree operations.
10. Program to implement Graph traversal using DFS
11. Program to implement Graph traversal using BFS
12. Program for bubble sort
13. Program for selection sort
14. Program for insertion quick sort
15. Program for merge sort

Outcomes:

After completion of course, student will be able to:

1. Implement linked list data structure.
2. Implement various sorting algorithms.
3. Implement various data structure such as stacks, queues, trees, graphs using java-programming language.
4. Implement tree and graph traversals.
5. implement graph traversal algorithms.

B.C.A-Semester II

DATA BASE MANAGEMENT SYSTEM

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:		
1. The objective of the course is to introduce the design and development of databases for data science with analytical features in relational databases.		
	SYLLABUS	
UNIT I:		
Introduction to Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, Classification of Database Management Systems, advantages and disadvantages of database approach, services of database systems, Components of Database Management System		
UNIT II:		
The Relational Database Model: Various Data Models, Relational Database model, Keys used in Relational model, Relational Data Integrity, Relational set operators, Relationships within the Relational Database, Codd's relational database rules. **Entity–Relationship Model:** Introduction, The components of an ER model, entities, attributes, relationships, Classification of Entity Sets, Attribute Classification, Relationship Degree, Relationship Classification		
UNIT III:		
Introduction to SQL: Structured Query Language (SQL) – Introduction - SQL data types - SQL literals , SQL operators: Arithmetic Operators - Comparison Operators - Logical Operators - Set Operators - Operator Precedence **Types of SQL commands:** DDL, DML, TCL, DCL **Tables:** Creating tables – Altering tables – dropping tables – displaying structure of table. Inserting, updating, and deleting: INSERT statement – Bulk inserts of data – UPDATE statement – DELETE statement		
UNIT IV:		
Queries and Subqueries : **using SELECT statement** Aggregate Functions **– Introduction – COUNT( ), COUNT(*), SUM( ), AVG( ), MAX( ) and MIN( ) functions.** Multiple table processing: **Joins and Unions**TCL commands: **COMMIT, ROLLBACK, and SAVEPOINT statements** DCL commands: **Privileges and roles – Granting and Revoking privileges and roles GRANT and REVOKE statements.**		
UNIT V:		
PL/SQL: Introduction, Structure of PL/SQL program, PL/SQL Data Types, operators used in PL/SQL, variables, declaring variables in PL/SQL, Creating and running a PL/SQL Program, **Control Structures:** Conditional control statements, Iterative Control statements, **Cursors:** Types of cursors, Steps to create a Cursor, using cursors in PL/SQL program		
Outcomes:		

Upon successful completion of the course, a student will be able to:

1. Gain knowledge of Database, DBMS and SQL.
2. Learn SQL as best analysis tool for extract data in different ways
3. Create a small database using SQL.
4. Able to construct SQL queries to Store, Retrieve data in database
5. Model database using ER Diagrams and design database schemas based on the model.

References:

1. Elimasri / Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Addison Wesley (2007).
2. Database Principles, Programming, and Performance, P.O'Neil, E.O'Neil, 2nd ed., ELSEVIER.
3. SQL: The Ultimate Beginners Guide by Steve Tale.
4. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill
5. Database Management Systems by Raghu Ramakrishnan, McGrawhill

Text Books:

1. Database management Systems, Alexis Leon and Mathews Leon, Vikas Publications 2002
2. Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, Seventh Edition, Thomson (2007)
3. SQL, PL/SQL the Programming Language of Oracle, Ivan Bayross, BPB publications

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester II

DATA BASE MANAGEMENT SYSTEM LAB

Credits: 1	Lab: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives: The major objective of this lab is to provide a strong formal foundation in database concepts, technology and practice to the participants to groom them into well-informed database application developers.

SYLLABUS

1. Illustrate the creation of a table with constraints
2. Creation of college database and establish relationships between tables
3. Employee database

   An enterprise wishes to maintain a database to automate its operations. Enterprise divided into certain departments and each department consists of employees. The following two tables describes the automation schemas

   Dept (deptno, dname, loc)

   Emp (empno, ename, job, mgr, hiredate, sal, comm, deptno)

   Generate the following queries using data of above tables.

   i. List out all employees details
   ii. Display empno, ename, job and sal columns of all employees
   iii. Display employee details who are working as 'CLERK'
   iv. Find out number of employees working in each department
   v. Find out job wise total salaries and number of employees.
   vi. Calculate HRA as 30% and DA as 65% of salary
4. Demonstrate the use of GRANT and REVOKE commands to provide authorization

PL/SQL PROGRAMS

5. Write a PL/SQL program to check the given number is armstrong or not.
6. Write a PL/SQL program to check the given string is palindrome or not.
7. Writ a PL/SQL program to generate multiplication tables
8. Write a PL/SQL code to find the factorial of any number.
9. Write a PL/SQL program to check the given number is palindrome or not.
10. Write a PL/SQL program to display to 10 rows in Emp table based on their job and salary.
11. Write a PL/SQL program to raise the employee salary by 10% for department number 30 people
12. Write a procedure to update the salary of Employee, who are not getting commission by 10%.

Outcomes:

1. Able to apply the basic commands of SQL – DDL, DML.
2. Able to create the tables at different levels.
3. Able to create different databases with primary key, foreign keys and insert values for DDL and DML operations.
4. Able to solve the queries using PL/SQL.

Able to write procedures.

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications
B.C.A-Semester II
ACCOUNTING AND FINANCIAL MANAGEMENT

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:

1. This paper is designed to impart knowledge regarding concepts of Accounting and financial management. This course is useful for Students to get placements in different offices as well as companies in Accounts departments.

	SYLLABUS	
UNIT I:		

Fundamentals of Management

Definition – Nature & scope of Management – Characteristics of Management – Functions of Management – Henry Fayol Principles of Management – Effective Manager – Introduction to Financial Management – Definition - Need of financial management - characteristics of financial management

UNIT II:		

Introduction to Accounting

Need for Accounting – Definition – Objectives, Advantages – Book keeping and Accounting – Accounting concepts and conventions – Accounting Cycle – Classification of Accounts and its rules – Double Entry Book-keeping – Journalization – Posting to Ledgers, Balancing of ledger Accounts (problems).

UNIT III:		

Subsidiary Books

Types of Subsidiary Books – purchases Book- Purchase returns Book-Sales Book – Sales returns Book – Cash Book – Simple Cash Book – Two Columnar Cash Book – Three-column Cash Book – Petty cash Book (Problems).

UNIT IV:		

Bank Reconciliation Statement

Need for bank reconciliation - Reasons for difference between Cash Book and Pass Book Balances- Preparation of Bank Reconciliation Statement- Problems on both favorable and unfavorable balances.

UNIT V:		

Trail Balance and Final Accounts
Meaning objectives - Methods of preparation of trial balance –Total's method –Balances Method Preparation of Final Accounts: Trading account – Profit and Loss account – Balance Sheet – with adjustments- Bad debts- Provision for bad debts (Simple Problems).

Outcomes:		

1. Company Setup & Configurations.
2. Recording Financial Transactions.
3. Financial Reports

Text Books:		
1. T.S.Reddy & A. Murthy, Financial Accounting , Margham Publications 2. Organization and Management - by R.G. Agarwal TATA Mc Grawhill Pub. Ltd., 3. S.P. Jain & K.L Narang, Accountancy-I, Kalyani Publishers		
References:		
1.V.K. Goyal, Financial Accounting, Excel Books 2.K. Arunjothi, Fundamentals of Accounting; Maruthi Publications 3.Tulasian, Accountancy -I, Tata McGraw Hill Co.		

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
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B.C.A-Semester II

ACCOUNTING AND FINANCIAL MANAGEMENT LAB

Credits: 1	**Lab: 2 Hours**	**Tutorials: -**
Max Marks: 50	**External: 50 Marks**	**Internal:**

Course Objectives: The objective is to teach the basic application of **Tally** to ensure students have exposure and hands on experience that enables to use the **Tally** effectively & efficiently preparing them to bridge the gap between the industry interfaces with academics.

SYLLABUS

1. Preparation of ledger and cash book
2. Practice and functioning of triple column cash book
3. Creation of journal voucher
4. Creation of payment voucher
5. Preparation of Bank reconciliation statements
6. Create company using accounts
7. Displaying trial balance
8. Displaying financial statements

Outcomes:

1. Ability to explain how to use a Tally s/w and its advantages.
2. Will be able to create a company in Tally s/w.
2. Ability to prepare profit and loss accounts using Tally s/w.
3. Ability to prepare balance sheets for a given set of transactions.
4. Ability to create a Ledger accounts in Tally.

BACHELOR OF COMPUTER APPLICATIONS

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II YEAR I SEMESTER

Paper Code	Course	Teaching Hours	Sem End Exam	Mid Sem Exam*	Total Marks	Credits
BCA2.1.1	First Language-English-III	4	75	25	100	3
BCA2.1.2	Second Language-Hindi/Sanskrit -III	4	75	25	100	3
BCA2.1.4	Life Skill Course – IV	2	50	0	50	2
BCA2.1.5	Skill Development Course – IV	2	50	0	50	2
BCA2.1.6	Object Oriented Programming Through Java	4	75	25	100	4
BCA2.1.7	Object Oriented Programming Through Java Lab	2	50	0	50	1
BCA2.1.8	Operating Systems	4	75	25	100	4
BCA2.1.9	Operating Systems Lab	2	50	0	50	1
BCA2.1.10	Statistical Methods & their Applications	4	75	25	100	4
BCA2.1.11	Statistical Methods & their Applications Lab	2	50	0	50	1
Total		**32**	**675**	**125**	**800**	**25**

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications
B.C.A-Semester III
OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:

1. Object Oriented Programming (OOP) has become the predominant technique for writing software in the past decade. Many other important software development techniques are based upon the fundamental ideas captured by object-oriented programming.

	SYLLABUS	
UNIT I:		

Fundamentals of OOP : Introduction, Object Oriented paradigm, Basic Concepts of OOP **Overview of Java Language**: Introduction, Java features, Java program structure, Java tokens, Implementing a Java Program, Java Virtual Machine (JVM), Command line arguments. **Constants, Variables & Data Types:** Introduction, Constants, Data Types, Variables, Declaration of Variables, Giving Value to Variables, Scope of variables, Type casting, operators

UNIT II:		

Input and Output in Java: Reading Input with Java.util.Scanner Class, Displaying Output with System.out.println( ), **Control Statements in Java:** Conditional control statements, Iterative control statements, break Statement, continue Statement, return Statement, **Classes, Objects & Methods:** Introduction, Defining a class, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members

UNIT III:		

Arrays, Strings: Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Wrapper classes, **Inheritance**: Introduction, Types of inheritance, Overriding methods, Final variables and methods, Final classes, Abstract methods and classes

UNIT IV:		

Interfaces: Defining interfaces, Extending interfaces, Implementing interfaces, Accessing interface variables, Multiple Inheritance using interfaces, **Exceptions:** Types of errors: Compile-time errors, Run-time errors, Exceptions, Exception handling, Multiple Catch Statements

UNIT V:		

Multithreaded Programming: Introduction, Lifecycle of a Thread, Creating Threads, Extending the Threads, Stopping and Blocking a Thread, **Applet Programming:** Definition, Local and remote applets, Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state, Building Applet code, **Packages:** Introduction, Java API Packages, Creating Packages, Accessing a Package

Outcomes:		

The student would become competent enough to write, debug, and document well-structured java applications

1. Understand the concept and underlying principles of Object-Oriented Programming
2. Understand how object-oriented concepts are incorporated into the Java programming language
3. Develop problem-solving and programming skills using OOP concept
4. Understand the benefits of a well-structured program
5. Develop the ability to solve real-world problems through software development in high-level programming language like Java
6. Develop efficient Java applets and applications using OOP concept

Text Books:

1. E.Balaguruswamy, Programming with JAVA, A primer 3e, TATA McGraw-Hill Company

References:

1. Programming in Java by Sachin Malhotra, OXFORD University Press
2. Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao &Kogent Learning Solutions Inc.
3. John R. Hubbard, Programming with Java, Second Edition, Schaum‟s outline Series, TATA McGraw-Hill Company.
4. Deitel & Deitel. Java TM: How to Program, PHI (2007)
5. Java Programming: From Problem Analysis to Program Design- D.S Mallik
6. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press (2008)

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester III

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

Credits: 1	Theory: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives:

1. To build software development skills using java programming for real world applications.
2. To implement object-oriented concepts of java.
3. To implement classical problems using java programming.

SYLLABUS

1. WAP to find whether a number is prime or not
2. WAP to demonstrate the factorial of a number.
3. WAP to display a number is even or odd
4. WAP to find a sub string in the given string.
5. WAP to arrange the given strings in Alphabetic Order.
6. WAP to search an element using arrays
7. WAP to implement Addition and multiplication of two Matrices.
8. WAP to demonstrate the use of Constructor.
9. WAP to demonstrate the use of overriding Method.
10. WAP for single Inheritance.
11. WAP for implementing Interface.
12. WAP on Multiple Inheritance.
13. WAP for to implement Thread
14. WAP to demonstrate Exception handling.
15. WAP to demonstrate Applet program.

Outcomes:

1. Student can write programs using concepts of OOP.
2. Able to write programs on method overloading and overriding techniques.
3. Able to implement programs by reusing the properties of existing classes.
4. Acquire knowledge on how to handle multiple requests and process them using multithreading.

Able to write client-side application development using applets.

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester III

OPERATING SYSTEMS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:

1 To know the basic Structure, Components and Organization of Operating System.
2 To learn the notation of a Process-a Program in Execution, Management, Scheduling and Classic Problems of Synchronization.
3 To gain knowledge in various Memory Management Techniques.
4 To understand Various File operations.

	SYLLABUS	
UNIT I:		

Operating System Introduction: Operating Systems Objectives and functions, Computer System Architecture, OS Structure, Evolution of Operating Systems (Simple Batch, Multi programmed, Distributed Systems, Real-Time Systems), Operating System services, System Calls, Types of System Calls

UNIT II:		

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Process Scheduling - Schedulers, Non-Preemptive (FCFS, SJF) and preemptive Scheduling algorithms (RR), **Threads**: Definition, uses of threads, types of threads

UNIT III:		

File System Interface – **Files**: Introduction to files, File types, basic operations on files, file attributes, File Access methods, File Sharing, Protection, File System Structure, **Directories**: Introduction to directories, Directory Structure, **Mass Storage Structure** - Overview of Mass Storage Structure, Disk Structure, Disk Attachment

UNIT IV:		

Deadlocks - System Model, Deadlock Characterization, **Methods for Handling Deadlocks**: Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.

UNIT V:		

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table. Segmentation, Segmentation with Paging

Outcomes:		

The students will be able to:

1. Understand the main components and Structure of Operating System& their functions.
2. Analyze various ways of Process Management & CPU Scheduling Algorithms.
3. Evaluate various device and resources like Memory, Time and CPU Management techniques in distributed systems.
4. Apply different methods for Preventing Deadlocks in a Computer System.

Text Books:		
1. Operating system Concepts: Abraham Silberschatz, Peter B. Galvin, Greg Gagne, 8th Edition, Wiley. 2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.		
References:		
1. Principles of Operating Systems by Naresh Chauhan, OXFORD University Press 2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson. 3. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.		

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester III

OPERATING SYSTEMS LAB

Credits: 1	Theory: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives:

1. To familiarize the students with the Architecture of UNIX Operating System.
2. To learn the mechanisms of CPU Scheduling and Deadlock Detection algorithms.
3. To learn mechanisms of Processes synchronization using semaphores.

SYLLABUS

1. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
2. Developing applications using Inter Process Communication (using shared memory)
3. Implement any two memory management schemes
4. Implement file allocation techniques (Linked)
5. Implement Deadlock prevention algorithm.
6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Round robin. Compute and print the average waiting time and average turnaround time.
7. Implement file allocation techniques (Indexed)
8. Implement file allocation techniques (Contiguous)
9. Developing applications using Inter Process Communication (pipes)
10. Developing applications using Inter Process Communication (message queues)
11. Implement Deadlock detection algorithm.
12. Implement Deadlock avoidance algorithm.

Outcomes:

1. Students are able to differentiate difference between MS-DOS, Windows and UNIX OS.
2. Students are able to write programming by using system calls (read, write, fclose, fork, perror, pipe, sysconf) using vi editor.
3. Learn the role of CPU Scheduling algorithms and memory management using page replacement algorithms.
4. Students are familiar with basic UNIX commands.
5. Be familiar with shell programming and shell commands.

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)

Department of Computer Sciences

B.C.A-Semester III

STATISTICAL METHODS AND THEIR APPLICATIONS

Credits: 4	Theory: 6 Hours	Tutorials: -
Max Marks: 100	External: 100 Marks	Internal: 25

Course Objectives:

1. To understand the scope and limitations of statistical methods.
2. To understand the Arithmetic mean, median, mode, geometric mean and Harmonic mean and their properties.
3. Apply the Measures of dispersion techniques to find deviations central tendency.
4. Find the differences between Karl Pearson's, Bowley's and Kelly's measures of skewness.
5. To understand the use of linear regression analysis to develop an empirical model of experimental data.

SYLLABUS

Unit I:

Introduction - scope and limitations of statistical methods - classification of data - Tabulation of data - Diagrammatic and graphical representation of data - Graphical determination of percentiles and quartiles.

Unit II:

Measures of location: Arithmetic mean, median, mode, geometric mean and Harmonic mean and their properties.

Unit III:

Measures of dispersion: range, Quartile deviation, mean deviation, standard deviation, combined standard deviation, co-efficient of variation.

Unit IV:

Measures of Skewness Karl Pearson's, Bowley's, Kelly's and co-efficient of skewness and kurtosis based on moments.

Unit V:

Correlation - Karl Pearson -spearman's rank correlation - concurrent deviation method.
Regression Analysis: Simple Regression Equations.

Outcomes:

1. Evaluate the probabilities and conditional probabilities.
2. Evaluate expectations and conditional expectations of random variables.
3. Approximate the distribution of sum of random variables using CLT.
4. Construct point estimators using the method of maximum likelihood.
5. Calculate the number of samples needed to construct confidence levels on the mean and variance of a normal distribution.

Reference Books:

1. Fundamental of mathematical Statistics - S.C.Gupta&V.K.Kapoor- Sultan Chand
2. Statistical Methods - Snedecor G.W. & Cochran W.G. oxford & +DII
3. Elements of statistics - Mode. E.B. -Prentice Hall
4. Statistical Methods - Dr.S.PGupta - Sultan chand& sons.

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester III

STATISTICAL METHODS AND THEIR APPLICATIONS LAB

Credits: 1	Theory: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives:
This lab course will provide opportunity to the learners to implement the concepts and techniques learned in Statistical Techniques course in C/C++ Language and/or in MS-Excel

SYLLABUS

Session 1 : Frequency distribution, central tendency and dispersion
Session 2,3,4 : Hypothesis testing, t distribution, chi square distribution, f distribution, normal distribution
Session 5 : Regression and correlation coefficient-univariate, multivariate
Session 6 : Anova test
Session 7 : Central charts
Session 8 : Time series
Session 9, 10 : Sampling for a problem domain and analyse –Case Study

Outcomes:

1. Skill to choose and apply appropriate statistical methods to obtain appropriate solutions to difficult mathematical problems.
2. Ability to apply various statistical techniques such as Measures of Central Tendency and Dispersion.
3. Skill to execute programs of various Statistical techniques for solving mathematical problems.
4. Familiarize with various types of charts.

BACHELOR OF COMPUTER APPLICATIONS

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II YEAR II SEMESTER

Sl. No	Paper Code	Course	Total Marks	Mid Sem Exam*	Sem End Exam	Teaching Hours	Credits
1	C10	Cryptography	100	25	75	4	4
2	C10-P	Cryptography Lab	50	0	50	2	1
3	C11	Data Mining & Data Ware Housing	100	25	75	4	4
4	C11-P	Data Mining & Data Ware Housing Lab	50	0	50	2	1
5	C12	Web Programming	100	25	75	4	4
6	C12-P	Web Programming Lab	50	0	50	2	1
7	C13	Unix	100	25	75	4	4
8	C13-P	Unix Lab	50	0	50	2	1
9	C14	Data Analytics using R	100	25	75	4	4
10	C4-P	Data Analytics using R Lab	50	0	50	2	1
11	C15	Object Oriented Software Engineering	100	25	75	4	4
12	C15-P	Object Oriented Software Engineering Lab	50	0	50	2	1
Total			**900**	**150**	**750**	**36**	**30**

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications.
B.C.A-Semester VI
CRYPTOGRAPHY

Credits: 4	**Theory: 4 Hours**	**Tutorials: -**
Max Marks: 100	**External: 75 Marks**	**Internal: 25 Marks**

Course Objectives:

1.Introduction of the importance of network security.
2.To discuss various classical encryption techniques.
3.To gain knowledge about various symmetric key cryptographic techniques.
4.To introduce various asymmetric key cryptographic techniques.
5.To get acquainted with hashing techniques and digital signatures.

SYLLABUS

Unit I:

Introduction to Cryptography:
Security Concepts, Security goals, Computer Security, Network Security, Internet Security, OSI Security Architecture, Attacks, Services, Mechanisms, what is Cryptography, Encryption and Decryption, Symmetric and Asymmetric key Cryptography, Types of Cryptanalysis attacks, Steganography.

Unit II:

Classical Encryption Techniques:
Substitution Ciphers: Monoalphabetic ciphers - Additive cipher, shift cipher, Caesar cipher, multiplicative cipher, Affine cipher, Monoalphabetic Substitution cipher. Polyalphabetic ciphers – Autokey cipher, Playfair cipher, Vigenere cipher, Hill cipher, onetime pad.**Transposition Ciphers**: Keyless transposition ciphers, Keyed transposition ciphers, Combination of the two approaches.

Unit III:

Symmetric Key Ciphers:
Stream Ciphers and Block Ciphers, S-Boxes, DES, Triple DES, The strength of DES, AES.

Unit IV:

Asymmetric Key Ciphers:
Principles of Public Key Cryptosystems, RSA Algorithm, Diffie Hellman Key Exchange, Rabin Cryptosystems, Introduction to ECC.

UNIT V:

Integrity, Authentication: Message Integrity, Message Authentication. **Hash Functions**: Introduction, SHA-1, Whirlpool. **Digital Signatures**: Definition, Process, Services, RSA Digital signature Scheme, Elgamal Digital Signature Scheme.

Outcomes:

1. Familiarize with security concepts and fundamentals of cryptography.
2. Learns about various classical encryption techniques.
3. Studies various symmetric key encryption techniques.
4. Understands various asymmetric key and authentication techniques.
5. Learns about various hashing techniques and digital signature schemes.

References:

1. Cryptography and network security: principles and practice By William Stallings, 7th Edition.
2. Cryptography and Network Security, Behrouz and A. Forouzan.
3. AtulKahate, Cryptography and Network Security, Tata-McGraw-Hill-2003.
4. Bruce Schneier – "Applied Cryptography", John Wiley & Sons Inc, 2001.

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
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B.C.A-Semester IV

CRYPTOGRAPHY LAB

Credits: 1	Theory: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives:

1. Introduction of the importance of cyber security.
2. To discuss various evidence techniques.
3. To gain knowledge about investigation and file conversions.
4. To introduce various asymmetric key cryptographic techniques.
5. To get acquainted with hashing techniques and digital signatures.

SYLLABUS

1. Write a program for recovering deleted files from a hard disk.
2. Write a program for gathering evidence.
3. Write a program for viewing files of various formats.
4. Write a program for locating files needed for a forensics investigation.
5. Write a program for performing image and file conversions.
6. Write a program for handling evidence data.
7. Write a program for creating a disk image file of a hard disk partition.
8. Give at least ten cyber-crime scenarios to students and make them analyze the scenario and submit report citing cyber laws which are violated.

Outcomes:

1. Familiarize with security concepts and fundamentals of cryptography.
2. Learns about various evidence techniques.
3. Studies various investigation and file conversions.
4. Understands various file of a hard disk partition.
5. Learns about handling evidence data.

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B.C.A-Semester IV

DATA MINING AND DATA WARE HOUSING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:

1. Be familiar with mathematical foundations of data mining tools.
2. Understand and implement classical models and algorithms in data warehouses and data mining
3. Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.
4. Master data mining techniques in various applications like social, scientific and environmental context. Develop skill in selecting the appropriate data mining algorithm for solving practical problems.

SYLLABUS

UNIT I:

Introduction: What Motivated Data Mining? Why Is It Important?, So, What Is Data Mining? , Data Mining—On What Kind of Data?: Data Mining Functionalities—What Kinds of Patterns Can Be Mined? Data Preprocessing: Why Preprocess the Data?, Descriptive Data Summarization: Measuring the Central Tendency, Measuring the Dispersion of Data, Data Cleaning, Data Integration and Transformation, Data Reduction.

UNIT II:

Data Warehouse and OLAP Technology: An Overview , What Is a Data Warehouse? , A Multidimensional Data Model, From Tables and Spreadsheets to Data Cubes, Stars, Snowflakes, and Fact Constellations: Schemas for Multidimensional databases, Examples for Defining Star, Snowflake and Fact Constellation Schemas, Data Warehouse Architecture: Steps for the Design and Construction of Data Warehouses,

UNIT III:

Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and a Road Map, Efficient and Scalable Frequent Item set Mining Methods: The Apriori Algorithm: Finding Frequent Item sets Using Candidate Generation, Generating Association Rules from Frequent Item sets.

UNIT IV:

Classification and Prediction: What Is Classification? What Is Prediction? , Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Decision Tree Induction, Attribute Selection Measures. Rule-Based Classification: Using IF-THEN Rules for Classification

UNIT V:

Cluster Analysis: What is Cluster Analysis?, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods. Hierarchical Methods: Agglomerative and Divisive Hierarchical Clustering.

Outcomes:		

At the end of the course, the student will demonstrate the following. The students will be able to:

1. Examine the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system.
2. Apply preprocessing statistical methods for any given raw data
3. Discover interesting patterns from large amounts of data to analyze and extract patterns to solve problems, make predictions of outcomes
4. Comprehend the roles that data mining plays in various fields and manipulate different data mining techniques
5. Select and apply proper data mining algorithms to build analytical applications.
6. Evaluate and implement a wide range of emerging and newly-adopted methodologies and technologies to facilitate the knowledge discovery.

Text Books:		

1. Data Mining: Concepts and Techniques Second Edition Jiawei Han University of Illinois at Urbana-Champaign Micheline Kamber
2. Data Warehousing by Reema Thareja, Oxford University Press

References:

1. Data Mining by Vikram Pudi, P. Radha Krishna, Oxford Universal Press
2. J. Han, M. Kamber and J. Pei, Data Mining: Concepts and Techniques, 3rd.Edition Morgan Kaufmann, 2011
3. Introduction to data mining –G. K. Gupta, PHI
4. Data mining, Data warehouse &Olap-Berson, Tata McGraw Hill

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester IV

DATA MINING AND DATA WARE HOUSING LAB

Credits: 1	Theory: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives:

1. Be familiar with mathematical foundations of data mining tools.
2. Understand and implement classical models and algorithms in data warehouses and data mining
3. Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.
4. Master data mining techniques in various applications like social, scientific and environmental context. Develop skill in selecting the appropriate data mining algorithm for solving practical problems

SYLLABUS

1. Demonstration of preprocessing on dataset student.arff.
2. Demonstration of preprocessing on dataset labor.arff.
3. Demonstration of Association rule process on dataset contactlenses.arff using Apriori algorithm.
4. Demonstration of Association rule process on dataset test.arff using Apriori algorithm.
5. Demonstration of classification rule process on dataset student.arff using j48 algorithm.
6. Demonstration of classification rule process on dataset employee.arff using j48 algorithm.
7. Demonstration of classification rule process on dataset employee.arff using id3 algorithm.
8. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm.
9. Demonstration of clustering rule process on dataset iris.arff using simple k-means.
10. Demonstration of clustering rule process on dataset student.arff using simple k-means..

Outcomes:

1. Examine the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system.
2. Apply preprocessing statistical methods for any given raw data
3. Discover interesting patterns from large amounts of data to analyze and extract patterns to solve problems, make predictions of outcomes

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B.C.A-Semester IV

WEB PROGRAMMING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:

1. To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.
2. To provide skills to design interactive and dynamic web sites.

	SYLLABUS	
UNIT I:		

Introduction to Internet: Definition of Internet – History of Internet – Advantages & disadvantages of Internet – Tools of internet - How internet works. **Introduction to WWW:** Definition of WWW – WWW tools - Web Terminology – web browser – web server, **E-Mail :** Definition of e-mail – advantages & disadvantages of e-mail, message components

UNIT II:		

Introduction to HTML: Basic HTML – HTML document structure – HTML tags – Basefont tag – title tag – body tag – Horizontal Rule Tag - Text formatting tags – Character tags - Character entities, **HTML Lists :** Ordered List , Unordered List & Definition List – Using colors – Using Images, **Hyperlinks**: Textual links, Graphical links, types of document links, anchor tag

UNIT III:		

HTML Tables – table creations tags, Nested Tables, **Frames:** Frame introduction - frame creation tags – Nested Frames – **Forms:** Form Controls : textbox, button, password, checkbox, radio button, select, text area - Processing of forms

UNIT IV:		

Introduction to Scripting: JavaScript Introduction - Simple Program - Obtaining User Inputs with Prompt Dialogs - variables – operators (arithmetic, relational, logical, increment and decrement). **JavaScript – Control Statements:** Introduction – conditional control statements (if, if…else, switch) – Repetitive statements (for, while, do…while) - break and continue Statements

UNIT V:		

JavaScript Functions: Introduction - Program Modules in JavaScript - Programmer-Defined Functions - Function Definitions - Scope Rules - JavaScript Global Functions, **Advanced HTML : Cascading Style Sheets (CSS):** Introduction – Using Styles: As an attribute, tag & external file – Defining Your own styles – **Properties and values :** properties related to Fonts, Backgrounds & colors, text , boxes & borders

Outcomes:		

1. To understand the web architecture and web services.
2. To practice latest web technologies and tools by conducting experiments.
3. To design interactive web pages using HTML and Style sheets.
4. To study the framework and building blocks of Integrated Development Environment.
5. To provide solutions by identifying and formulating IT related problems.

Text Books:		
1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley. 2. Deitel & Deitel , Goldberg "Internet and world wide web – How to program", pearson educations Asia		
References:		
1. Paul S.Wang Sanda S. Katila, An Introduction to Web Design Plus Programming,Thomson. 2. Robert W.Sebesta, Programming the World Wide Web, Third Edition, Pearson Education. 3. Joel Sklar, Principles of Web Design, Thomson. 4. Raj Kamal, Internet and Web Technologies, Tata McGraw Hill. 5. Gopalan & Akilandeswari, Web Technology: A Developer‟s Perspective, PHI.		

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
Department of Computer Applications

B.C.A-Semester IV

WEB PROGRAMMING LAB

Credits: 1	Theory: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives:

1. To design and implement websites with good aesthetic sense of designing.
2. To learn how XML and its related technologies function

SYLLABUS

1. Create a simple HTML page which demonstrates all types of lists.
2. Create a letter head of your college using following styles
   i. image as background
   ii. use header tags to format college name and address
3. Create a web page, which contains hyper links like fruits, flowers, animals. When you click on hyper links, it must take you to related web page; these web pages must contain with related images.
4. Create a hyperlink to move around within a single page rather than to load another page.
5. Create a leave letter using different text formatting tags.
6. Create a table format given bellow using row span and colspan.

RNO	NAME	MARKS				
		M1	M2	M3	M4	M5

   Insert 5 records.
7. Create a table with different formats as given bellow.
   i. Give different background and font colors to table header, footer and body.
   ii. Use table caption tag.
8. Write java script to find factorial of a number
9. Write java script to find sum of digits of a number
10. Write java script to display student details in a web page
11. Create a student Bio-Data, using forms.
12. Create a web page using following style sheets
    i. Inline style sheets.
    ii. Embedded style sheets.
    iii. External style sheets

Outcomes:

1.Students can able to understand lists, its types, header tags and image as background.
2.Students can able to create hyperlinks and the web page contains images. They can also use different types of tags.
3.Students can able to create tables using row span and column span. They can also divide a web page both horizontally and vertically.
4.Students can create their bio-data using forms. They can also create a web page using cascading styles.
5.Students are able to write java script programs by accepting values and can apply mathematical operations.

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B.C.A-Semester IV
UNIX

Credits: 4	**Theory: 4 Hours**	**Tutorials: -**
Max Marks: 100	**External: 75 Marks**	**Internal: 25 Marks**

Course Objectives:

1. To understand Unix Operating System
2. To explore the Basic Shell Commands

SYLLABUS

Unit I:

UNIX OPERATING SYSTEM
Overview of UNIX Operating System, basic features of Unix operating System, File Structure, CPU Scheduling, Memory Management, File System Implementation of Operating System Functions in UNIX.

Unit II:

Starting of Unix and Text Manipulation and user-to-user communication User Names and Groups, Logging In, Format of Unix Commands, Changing your password, Unix Documentation.

Unit III:

Files and Directories: File permission, Basic Operation on Files, Changing Permission Modes, Standard files, Processes Inspecting Files, Operating on Files, Printing Files, Rearranging Files, Sorting Files, Splitting Files, Translating Characters, On line communication, Off line communication.

Unit IV:

EDITORS
General characteristics, adding text and Navigation, changing text, searching for text, copying and Moving text, Features of Ex, Line Editors Ex and Ed, Stream editor SED, changing several file s in SED, AWK features.

Unit V:

Shell Programming:
Programming in the Bourne and C-Shell, Wild Cards, Simple Shell program, variables, Programming Construct, Interactive Shell scripts, Advanced Features, Unix Compiler, maintaining program System Administration Define System Administration, Booting the system, Maintaining User Accounts, File System, and special files, Backup and Restoration.

Outcomes:

1. Develop knowledge on functions, Objectives, structure and Features of UNIX Operating System.
2. Knowledge to Implement and Innovative basic and advanced UNIX commands.
3. Knowledge on File system in UNIX including accesses rights and permissions on files.
4. Develop basic knowledge on editors with their characteristics, especially on vi Editor.
5. Knowledge on Shell commands and features and types of shells with proper knowledge.

References:

1. Unix and shell Programming by B.M Harwani, OXFORD University Press
2. Unix Concept and application- Sumitabhadas
3. Unix Shell Programming-Yashwant Kanetkar
4. Unix Programming Environment- RobPike
5. Unix in a Nutshell- DonillGily.

Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)
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B.C.A-Semester IV

UNIX LAB

Credits: 1	**Theory: 2 Hours**	**Tutorials: -**
Max Marks: 50	**External: 50 Marks**	**Internal:**

Course Objectives:

1. To introduce Basic Unix general purpose Commands
2. To learn network Unix commands.
3. To learn C programming in Unix editor environment.
4. To learn shell scripts.

SYLLABUS

1. Execute of various file/directory handling commands.
2. Write a Simple shell script for basic arithmetic and logical calculations.
3. Write Shell scripts to check various attributes of files and directories.
4. Write Shell scripts to perform various operations on give n strings.
5. Write Shell scripts to explore system variables such as PATH, HOME etc.
6. Write Shell scripts to check and list attributes of processes.
7.Execute various system administrative commands
8.Write awk script that uses all of its features.
9.Use seed instruction to process /etc/password file.
10.Write a shell script to display list of users currently logged in.
11.Write a shell script to delete all the temporary files.
12.Write a shell script to search an element from an array using binary searching.

Outcomes:

1.Able to differentiate between windows and UNIX OS, features of UNIX OS.
2.Knowledge on basic and advanced UNIX Commands.
3.Learn to implement system calls in vi editor.
4.Learn to implement Scheduling and page replacement algorithms as per UNIX OS.
5.Learn to implement Shell commands and develop skills on shell programming.

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B.C.A-Semester IV

DATA ANALYTICS USING R

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:

1. Exposure to theory as well as practical knowledge through R used in data analytics.
2. Fundamental basics of statistics used in analyzing the data
3. How to find the pattern in the given dataset
4. How to interpret the data graphically
5. How to apply different types of algorithms for the given dataset

	SYLLABUS	
UNIT I:		

Introduction to Data analytics: Overview of Bigdata, Need of Data Analytics, Applications of Data Analytics, Datasets, tools for data analytics

Basic Statistics**: Mean, Median, mode, Standard Deviation, Variance, Correlation.** Distribution: **normal, binomial.**

UNIT II:		

Basic Analysis Techniques: **Chi-Square Test, t-Test.** Data Analysis Techniques: **Linear and Logistic Regression.**

Introduction to R: R overview and history, Basic features of R, Installing R, packages in R, Getting started: Window section of RStudio, first interaction, command line versus scripts, comments. Variables in R: Naming variables, assigning values to variables, finding variables, removing variables, operators.

R Data Structures: Vectors, Character Strings, Matrices, Lists, Data Frames, and Classes.

UNIT III:		

Input of Data: input of data from terminal, input of data through R-objects. **Output functions:** print () function, cat () function. **In-Built functions in R:** Mathematical functions, String functions. **User defined functions** – function without arguments, function with arguments.

Decision making structure: simple if statement, if-else statement, switch statement. **Loops:** while loop, for loop, Repeat loop.

UNIT IV:		

Data Types of R

Vectors: class of a vector, Elements of a vector, acceding vector elements, functions for vectors, obtaining the Length of a Vector. **Common vector operations:** Arithmetic & logical operations, Vector Indexing, using all () and any () functions, Vectorized operations, NA and NULL values.

Matrices: creating a matrix, accessing matrix elements, functions for matrices, matrix indexing, filtering on matrices. **Arrays:** creating an array, accessing elements of an array, functions for array.

UNIT V:		

Lists: creating a list, accessing list elements, functions for list, General list operations, list indexing, adding and deleting list elements.

Import and Export of data: Import and export of data in excel file:reading from excel format, write to excel format.

Data Visualization techniques: Introduction, pie chart, bar chart, scatter and box plots.

Outcomes:		

1. Data-Visualization tools and techniques offer executives and other knowledge workers new approaches
2. Data visualization is a general term that describes any effort to help people understand the significance of data by placing it in a visual context.
3. Patterns, trends and correlations that might go undetected in text-based data can be exposed and recognized easier with data visualization software.
4. It isn't just the attraction of the huge range of statistical analyses afforded by R that attracts data people to R. The language has also developed a rich ecosystem of charts, plots and visualizations over the years.

Text Books:		

1. Data Analytics with R, WILEY Publishing, Dr.Bharti Motwani.
2. The Art of R Programming by Norman Matlof, No starch press, SAN FRANSISCO,2011.
3. Data Analytics using R, McGrawHill Publications, Seema Acharya

References:

1. Rumset D. J. (2010): Statistical Essentials for Dummies. Hoboken: Wiley Publishing
2. R for Data Science: Import, Tidy, Transform, Visualize, and Model Databy adley ickham , O'Reilly

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B.C.A-Semester IV

DATA ANALYTICS USING R LAB

Credits: 1	Theory: 2 Hours	Tutorials: -
Max Marks: 50	External: 50 Marks	Internal:

Course Objectives:

1. Exposure to theory as well as practical knowledge through R used in data analytics.
2. Fundamental basics of statistics used in analyzing the data
3. How to find the pattern in the given dataset
4. How to interpret the data graphically
5. How to apply different types of algorithms for the given dataset

SYLLABUS

1. Write a program in R. To compute the product of two values
2. Write a program in R. to check whether the given number is even or odd.
3. Write a program in R. Sum of natural numbers.
4. Write a program in R. Find the factorial.
5. Exporting data to Excel, Text File
6. Mean, Median, Standard Deviation, Variance, Correlation in R
7. Correlation in R:Pearson & Spearman with Matrix Example
8. T Test in R
9. Chi-Square Test in R
10. Prediction using linear regression and visualizing the regression graphically
11. Prediction using logistic regression and visualizing the regression graphically
12. Bar chart in R

Outcomes:

1. Learn R programing language with simple example.
2. Ability to write different programs in R.
3. Familiar to apply statistical methods in R.
4. Analyze various tests in R .

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B.C.A-Semester IV

OBJECT ORIENTED SOFTWARE ENGINEERING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 75 Marks	Internal: 25 Marks

Course Objectives:

1. Illustrate basic taxonomy and terminology of the software engineering.
2. Plan and monitor the control aspects of project.

SYLLABUS

UNIT I:

The Scope of Object Oriented Software Engineering: Historical Aspects, Economic Aspects, Maintenance Aspects, Requirements, analysis and design aspects, the object oriented Paradigm, Terminology, Ethical Issues.

Software Life Cycle Models: Software Development In Theory, Risks and other aspects of Iteration and Incrementation, Managing Iteration and Incrementation, other Life Cycle Models: Code and Fix, Waterfall, Rapid Prototyping, Open Source, Agile Processes, Synchronize and Stabilize, Spiral Models, Comparison of Life Cycle Models.

UNIT II:

The Software Process : The Unified Process, Iteration and Incrementation, The Requirements Workflow, The Analysis workflow, The Design Workflow ,The Implementation workflow, the test workflow, Post Delivery Maintenance, Retirement, the phases of the unified process, one-versus two-dimensional life cycle models, improving the software process, capability maturity models, costs and benefits of software process improvement.

UNIT III:

Models t o O b j e c t s : What is a module? Cohesion, Coupling, Data Encapsulation, Abstract Data Types, Information Hiding, Objects, Inheritance, Polymorphism and Dynamic Binding, The Object-Oriented Paradigm.
Reusability and Portability: Objects and Reuse, Reuse during design and implementation reuse and post-delivery maintenance, portability, techniques for achieving portability.
Planning and Estimating: planning and the software process, Estimating duration and cost.

UNIT IV:

The Requirements workflow: Determining what client needs , overview of the requirements, understanding the domain, the business model, initial requirements, rapid prototyping , human factors, reusing the rapid prototype, metrics for the requirement workflow.
The Analysis Workflow: the analysis workflow, extracting the entity classes.
The Design Workflow: Object –Oriented Design, the design workflow, formal techniques for detailed design, real time design techniques.

UNIT V:

The implementation workflow: choice of programming languages, good programming practice, coding standards, code reuse, integration, the implementation workflow.
Testing: Quality Issues, Non – Execution based testing, execution based testing, what should be tested?, testing versus correctness proofs. Test case selection, Black Box Unit Testing techniques, Glass-Box Unit Testing Techniques.

Outcomes:		
1. Explore the basic concepts of software engineering. 2. Choose appropriate life cycle model for a project. 3. Implement the phases of the traditional software development process. 4. Design various test cases for a software product. 5. Analyze different architectural views.		
Text Books:		
Stephen R.Schach -Object Oriented Software Engineering McGraw Hill Higher Education		
References:		
Timothy C.Lethbridge, Robert Language Object Oriented Software Engineering		

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Department of Computer Applications

B.C.A-Semester IV

OBJECT ORIENTED SOFTWARE ENGINEERING LAB

Credits: 1	**Theory: 2 Hours**	**Tutorials: -**
Max Marks: 50	**External: 50 Marks**	**Internal:**

Course Objectives:

1. Illustrate basic taxonomy and terminology of the software engineering.
2. Plan and monitor the control aspects of project.

SYLLABUS

1 Online Examination System.
2 Online Railway Reservation.
3 Library Maintenance System.
4 Any E-Commerce Portal.
5 Biometric Attendance System.

Outcomes:

1. Understand the basic concepts of software engineering.
2. Applied appropriate life cycle model for a project.
3. Implement the phases of the traditional software development process.
4. Design various test cases for a software product.
5. Analyze different architectural views.

ALL SEMESTERS
MODEL QUESTION PAPER

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

SECTION-A

Answer any FIVE of the following Questions: (5 x 10= 50 Marks)

1. } UNIT-1
2. }
3. } UNIT-2
4. }
5. } UNIT-3
6. }
7. } UNIT-4
8. }
9. } UNIT-5
10. }

SECTION - B

Answer any FIVE of the following Questions (5 × 3 = 15 Marks)

11. } UNIT-1
12. }
13. } UNIT-2
14. }
15. } UNIT-3
16. }
17. } UNIT-4
18. }
19. } UNIT-5
20. }

SECTION - C

Answer the following Questions (5 × 2 = 10 Marks)

1. UNIT-1
2. UNIT-2
3. UNIT-3
4. UNIT-4
5. UNIT-5