ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory body of the Government of Andhra Pradesh)

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SYLLABUS OF BACHELOR OF COMPUTER APPLICATIONS UNDER CBCS FRAMEWORK
WITH EFFECT FROM 2020-2021

PROGRAMME: THREE-YEAR B.C.A

(With Learning Outcomes, Unit-wise Syllabus, References, Co-curricular Activities & Model Q.P. For Fifteen Courses of 1, 2, 3 & 4 Semesters)

(To be Implemented from 2020-21 Academic Year)

First Semester

S.No	Paper Code	Subject	Hours/ Week	No of Credits	Max. Marks Internal assessment	Max. Marks University Exam	Total Marks
1		English – I	4	3	25	75	100
2		Language(H/T/S) – I	4	3	25	75	100
3		Life Skill Course – I	2	2	-0-	50	50
4		Skill Development Course – I	2	2	-0-	50	50
5	C1	Computer Fundamentals & Office tools	4	4	25	75	100
6	C1-P	Computer Fundamentals & Office tools-Lab	2	1	-0-	50	50
7	C2	Programming in C	4	4	25	75	100
8	C2-P	Programming in C Lab	2	1	-0-	50	50
9	C3	Numerical and Statistical Methods	4	4	25	75	100
10	C3-P	Numerical and Statistical Methods-Lab	2	1	-0-	50	50
Total			30	25	125	625	750

Second Semester

S.No	Paper Code	Subject	Hours/ Week	No of Credits	Max. Marks Internal assessment	Max. Marks University Exam	Total Marks
1		English – II	4	3	25	75	100
2		Language(H/T/S) – II	4	3	25	75	100
3		Life Skill Course – II	2	2	-0-	50	50
4		Skill Development Course – II	2	2	-0-	50	50
5		Skill Development Course – III	2	2	-0-	50	50
6	C4	Data Structures	4	4	25	75	100
7	C4-P	Data Structures Lab	2	1	-0-	50	50
8	C5	Object Oriented Analysis & Design	4	4	25	75	100
9	C5-P	Object Oriented Analysis & Design Lab	2	1	-0-	50	50
10	C6	Database Management Systems	4	4	25	75	100
11	C6-P	Database Management Systems Lab	2	1	-0-	50	50
Total			32	27	125	675	800

Third Semester

S.No	Paper Code	Subject	Hours/ Week	No of Credits	Max. Marks Internal assessment	Max. Marks University Exam	Total Marks
1		English –III	4	3	25	75	100
2		Language(H/T/S) – III	4	3	25	75	100
3		Life Skill Course – III	2	2	-0-	50	50
4		Life Skill Course – IV	2	2	-0-	50	50
5		Skill Development Course – IV	2	2	-0-	50	50
6	C7	Accounting and Financial Management	4	4	25	75	100
7	C7-P	Accounting and Financial Management Lab	2	1	-0-	50	50
8	C8	Object Oriented Programming Through Java	4	4	25	75	100
9	C8-P	Object Oriented Programming Through Java Lab	2	1	-0-	50	50
10	C9	Operating Systems	4	4	25	75	100
11	C9-P	Operating Systems Lab	2	1	-0-	50	50
Total			32	27	125	675	800

Fourth Semester

S.No	Paper Code	Subject	Hours/ Week	No of Credits	Max. Marks Internal assessment	Max. Marks University Exam	Total Marks
1	C10	Cyber Laws	4	4	25	75	100
2	C10-P	Cyber Laws Lab	2	1	-0-	50	50
3	C11	Data Mining and Data Warehousing	4	4	25	75	100
4	C11-P	Data Mining and Data Warehousing Lab	2	1	-0-	50	50
5	C12	Web Programming	4	4	25	75	100
6	C12-P	Web Programming Lab	2	1	-0-	50	50
7	C13	Design of Object Oriented Applications	4	4	25	75	100
8	C13-P	Design of Object Oriented Applications Lab	2	1	-0-	50	50
9	C14	Data Analytics using R	4	4	25	75	100
10	C14-P	Data Analytics using R Lab	2	1	-0-	50	50
11	C15	Object Oriented Software Engineering	4	4	25	75	100
12	C15-P	Object Oriented Software Engineering Lab	2	1	-0-	50	50
Total			**36**	**30**	**150**	**750**	**900**

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
I	C1	Computer Fundamentals and Office Tools	4	60	4

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.

Course 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.

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

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

References:

1. Rajaraman, Introduction to Information Technology, PHI
2. Introduction to Computers – Peter Norton Mcgraw Hill.
3. Microsoft Excel 2007, Custom Guide Inc, 2007

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
I	C1-P	Computer Fundamentals and Office Tools Lab	2	30	1

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

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
I	C2	Programming in C	4	60	4

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.

Course 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.

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 Examples

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

Text Books:

1. Computer Fundamentals and Programming in C by Reema Thareja from Oxford University Press

Reference Books

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.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
I	C2-P	Programming in C Lab	2	30	1

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
    i. Write data into a File.
    ii. Read data from a File.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
I	C3	Numerical and Statistical Methods	4	60	4

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.

Course 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.

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
(i) Cramer's Rule
(ii) 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.

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

Reference Books:

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.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
I	C3-P	Numerical and Statistical Methods Lab	2	30	1

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.

NUMERICAL AND STATISTICAL METHODS

(Statistical tables and Electronic Calculators are allowed)

MODEL QUESTION PAPER

TIME: 3 HOURS **MAX. MARKS:75**

SECTION-A

Answer any five questions. Each question carries 5 marks 5 X 5 = 25M

1. The following table shows the temperature $f(t)$ as follows

	1	2	3	4	5	6	7
$f(t)$	81	75	80	83	78	70	60

Use Simpson's $\frac{1}{3}$ method to estimate $\int_1^7 f(t)\,dt$

2. Construct backward difference table to the following data and find $\nabla^2 y_2, \nabla^4 y_2$

x	0	1	2	3	4	5	6
y	0	1	16	81	256	625	1296

3. If $A=\begin{bmatrix}8 & 9\\ 5 & -1\end{bmatrix}, B=\begin{bmatrix}-2 & 3\\ 4 & 0\end{bmatrix}$ then find AB *and* BA

4. If $A=\begin{bmatrix}1 & 2\\ 1 & 1\end{bmatrix}$ then find A^2+A+I

5. Examine the following Matrix is Singular or Non-Singular $A=\begin{bmatrix}3 & 8 & 1\\ -4 & 1 & 1\\ -4 & 1 & 1\end{bmatrix}$.

6. Find the inverse matrix of $A=\begin{pmatrix}2 & -3\\ 4 & 6\end{pmatrix}$

7. Find Median, and Mode to the following data : 4, 5, 6, 4, 5, 4, 10

8. Find Karl-Pearsons Coefficient of Skewness to the following data mean=150, mode=185, standard deviation $(\sigma) = 55$.

9. The ranks of two subjects A and B are given below. Obtain rank correlation coefficient.
$(3,2),(4,4),(1,1),(2,3),(6,6),(5,5)$

10. . Define sample space and random experiment.

SECTION-B

ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 10 MARKS 5 X 10 = 50

11. Find $f(1.6)$ using Newton's forward Interpolation formula from the following table

x	1	1.4	1.8	2.2
y	3.49	4.82	5.96	6.5

12. Evaluate $\int_0^6 \frac{1}{1+x}\,dx$ by using trapezoidal rule.

13. $A=\begin{bmatrix}1 & 2\\ 0 & 5\end{bmatrix}$ *and* $B=\begin{bmatrix}2 & 5\\ 1 & 0\end{bmatrix}$ *then find* $(i)\,AB\,(ii)\,BA\,(iii)\,A+B\,(iv)\,(A+B)^T\,(v)\,A-B$

14. Evaluate $A^2-3A+9I$ where $A=\begin{bmatrix}1 & -2 & 3\\ 2 & 3 & -1\\ -3 & 1 & 2\end{bmatrix}$ and I is the unit Matrix.

15. Find the rank of $A=\begin{bmatrix}3 & -1 & 2\\ -3 & 1 & 2\\ -6 & 2 & 4\end{bmatrix}$.

16. Solve the equations by using Matrix Inversion method
$2x-y+3z=9, x+y+z=6, x-y+z=2$

17. Calculate Arithmetic Mean for the following data :

X	**1**	**2**	**3**	**4**	**5**	**6**	**7**
F	**5**	**9**	**12**	**17**	**14**	**10**	**6**

18. The following are the runs scored by two batsmen A and B in 10 Innings. Find out who is better run getter and who is more consistent player

A runs	**90**	**110**	**5**	**10**	**125**	**15**	**35**	**16**	**134**	**10**
B runs	**65**	**68**	**52**	**47**	**63**	**25**	**25**	**60**	**55**	**60**

19. Calculate coefficient of correlation of the following data :

x	10	12	13	16	17	20	25	30	34
y	20	22	26	27	29	33	37	40	42

20. Write classical, statistical and axiomatic definitions of probability.

Instruction to Paper Setter:

Paper Setter must select TWO Short Questions and TWO Essay Questions from Each Unit

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
II	C4	Data Structures	4	60	4

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.

Course 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.

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, DEQueue.

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, Merge Sort.
SEARCHING: Definition, searching methods - Linear or Sequential Search, Binary Search.

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

Reference Books:

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

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
II	C4-P	Data Structures Lab	2	30	1

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

Semester	Course Code	Course Title	Hours/ Week	Hours	Credits
II	C5	Object Oriented Analysis and Design	4	60	4

Course Objectives:

1. To provide a sound understanding of the fundamental concepts and historical evolution of the model.
2. To facilitate a mastery of the notation and process of object-oriented analysis and design.

Course Outcomes:

By the end of the course, student will be able to:

1. Have Knowledge in evolution and foundations of OO Model and its elements.
2. Identify relationship between classes and objects.
3. Know importance of classification and can identify classes and objects.
4. Have basic knowledge of UML.
5. Knowledge in syntax and semantics of UML.

UNIT - I:

The Object Model-The Evolution of the Object Model: The generations of programming languages, the topology of Programming languages. **Foundations of the Object Model:** Object Oriented Analysis, Object Oriented design, Object Oriented Programming. **Elements of the Object Model:** Programming Paradigm(programming style), The Major and Minor Elements of the Object Models, Abstraction, Encapsulation, Modularity, Hierarchy(single inheritance, multiple inheritance, Aggregation), Static and Dynamic Typing, Concurrency, Persistence.

UNIT - II:

Classes and Objects-The Nature of an Object: What is and what is not an Object, State, Behavior, and Identity. **Relationships among Objects:** Links, Aggregation. The Nature of a Class: Interface and Implementation, Class Lifecycle. **Relationships among Classes:** Association: Semantic Dependencies, Multiplicity, Inheritance, Polymorphism, Aggregation, Dependencies. **The Interplay of Classes and Objects:** Relationship between Classes and Objects

UNIT - III:

Classification-The Importance of Proper Classification: The Difficulty of Classification, The Incremental and Iterative Nature of Classification. **Identifying classes and Objects:** Classical and Modern Approaches.
Object Oriented Analysis: Classical Approaches, Behavior Analysis, Domain Analysis, Use Case Analysis.

UNIT - IV:

The Unified Modeling Language: Diagram Taxonomy: Structure Diagrams, Behavior Diagrams. **The Use of Diagrams in Practice:** Conceptual, Logical and Physical Models
The Syntax and Semantics of the UML: The Package Diagrams, Component Diagrams, Deployment Diagrams, Use Case Diagrams.

UNIT - V:

The Syntax and Semantics of the UML: Activity Diagrams, Class Diagrams, Sequence Diagrams, Interaction Diagrams, State Machine Diagrams, Object Diagrams

Text Book:

1. Object-Oriented Analysis and Design with Applications, 3rd Edition, By: Robert A. Maksimchuk, Bobbi J. Young, Grady Booch, Jim Conallen, Michael W. Engel, Kelli A. Houston, Pearson education.

Reference Books:

1. James Rumbaugh, Jacobson and Booch, Unified Modeling Language reference manual, PHI.
2. Ali Bahrami, Object oriented system development-using the unified modeling language, Tata McGraw Hill international edition, computer science series.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
II	C5-P	Object oriented analysis and design lab	2	30	1

1. Demonstrate Package Diagram for Hydroponics Gardening system.
2. Demonstrate Component Diagram for the Environmental control system.
3. Demonstrate Deployment Diagram for Environmental control system.
4. Develop Use Case Diagram for Hydroponics Gardening system.
5. Demonstrate Activity Diagram for Hydroponics Gardening system.
6. Demonstrate Class Diagram for the Environmental control system.
7. Demonstrate sequence diagram Environmental controller system.
8. Demonstrate sequence diagram for returning and removing books for library system
9. Demonstrate use case for returning book with fine for library system.
10. Draw the State Machine Diagram for the Duration Timer.
11. Draw the Interaction Diagram for Library system.
12. Demonstrate Object Diagram for the library system.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
II	C6	Data Base Management System	4	60	4

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.

Course Learning 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.

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

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

References Books:

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

Semester	Course Code	Course Title	Hours/ Week	Hours	Credits
II	C6-P	Data Base Management System Lab	2	30	1

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%.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
III	C7	Accounting and Financial Management	4	60	4

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.

Course Outcomes:

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

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 –Totals 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).

Reference 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
4. Tulasian, Accountancy -I, Tata McGraw Hill Co.
5. V.K.Goyal, Financial Accounting, Excel Books

K. Arunjothi, Fundamentals of Accounting; Maruthi Publications

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
III	C7-P	Accounting and Financial Management Lab	2	30	1

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

ACCOUNTING AND FINANCIAL MANAGEMENT
MODEL QUESTION PAPER

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

SECTION-A

Answer any FIVE of the following Questions: **(5 x 5= 25 Marks)**

1. Write characteristics of management
2. Explain role of effective manager
3. Write advantages of accounts
4. Differentiate book keeping and accounting
5. From the following particulars prepare Raju's A/c

	Rs.
1-1-2014 Amount due from Raju	8,000
5-1-2014 Sold goods to Raju	14,000
8-1-2014 Purchased goods from Raju	5,000
14-1-2014 Cash received from Raju	6,000
24-1-2014 Cash paid to Raju	4,000
31-1-2014 Raju's A/c settled by cheque	

6. A trader maintains Petty cash book under imprest system. Record the following Transactions in his Petty Cash Book:

2014		Rs.
Sep. 1	Received for Petty payments	500
2	Postage	40
5	Stationery	25
8	Advertising	50
12	Wages paid	20
16	Carriage	15
20	Conveyance	22
30	Postage	50

7. From the following particulars prepare bank Reconciliation statement as on 30.04.2010
   a) Bank Balance as per Pass book Rs 12000.
   b) Cheques deposited but not collected Rs.2000
   c) Cheques issued but not presented Rs 1500
   d) Bank Charges appeared in Passbook Rs 200
8. What are the causes for the difference in cash book and pass book balance ?
9. From the following particulars Prepare Trial Balance.

Cash	4000	Plant	30000
Capital	25000	Bank Loan	6000
Stock	5000	Sales	10000
O/S Expenses	1000	Reserve	3000
Drawing	3000	O/S Income	4000
Purchase Returns	1000	Creditors	15000
Purchases	15000		

(PTO)

10. Prepare trading account from the following items

rchases	50,000
les	2,65,000
ɔening Stock	20,000
rriage	1,500
d debts	4,000
les Returns	1,000
ɔsing Stock	62,000

SECTION – B

Answer any FIVE of the following Questions **(5 × 10 =50 Marks)**

11. Define Management. Explain the functions of management
12. Write about Henry Fayol principles of Management
13. Classify the following into Personal, Real and Nominal Accounts
    (a) Capital (b) Rent recovered (c) Accrued Interest
    (d) Discount (e) Bad debts (f) Carriage (g) goodwill
    (h) Premises (i) Investments (j) Work-in-Progress.
14. Journalise the following transactions.
    (a) Rao starts business with Rs.10,000 cash and a building worth Rs.50,000
    (b) Purchased goods worth Rs.20,000 out of which goods worth Rs.12,000 was on credit from Shyam.
    (c) Sold goods on credit worth Rs.16,000 to Ram.
    (d) Received Rs.15,600 from Ram in full settlement of his account.
    (e) Paid Rs.11,800 to Shyam in full settlement of Rs.12,000 due to him.
    (f) Paid wages Rs.500 and salaries Rs.2,000
15. Enter the following transactions in suitable subsidiary books.

		Rs.
Jan.1	Purchased goods from Rekha	7,500
4	Sold goods to Midhum	8,000
5	Returned gods to Rekha	500
6	Sridevi bought goods from us	4,000
8	Received goods returned by Midhun	400
10	Rajesh sold goods to us	4,000
15	Sold goods to Kishore	3,000
16	Returned goods to Rajesh	600
20	Kishore returns goods	500

(PTO)

16. Enter the following transactions in a three column cash book.

2018		Rs.
January 1	Started business with cash	40,000
2	Opened savings bank account with Vijaya Bank	16,000
5	Bought goods by cheque	350
6	Received cheque from Suhas	400
	Allowed him discount	20
8	Sold goods for cash	80
10	Paid into bank – Cash	60
	Cheque	400
14	Paid Sateesh by cheque	690
	Discount received	10
17	Paid Carriage	300
20	Drew from bank for office	400
31	Paid Salaries by cheque	200

17. From the following particulars prepare Bank Reconciliation Statement.
    (a) Debit balance as per cash book is Rs. 10,000.
    (b) Cheques issued but not presented for payments Rs. 1,500.
    (c) Cheques paid into bank but not credited Rs. 1,000.
    (d) Interest credited in pass book only Rs. 100.
    (e) Cheques received, entered in cash book but omitted to send to bank Rs. 500.
    (f) Bills collected and credited in pass book only Rs. 2,000.
18. From the following transactions prepare bank reconciliation statement of Prabhas as on 30.04.2018
    a) Overdraft balance as per pass book Rs. 20,000
    b) On 24th . April Cheques worth Rs. 8000 were issued of which cheques worth Rs 5000 were presented for payment.
    c) On 29th April Cheques worth Rs. 10000 were Deposited with the bank of which cheques worth Rs 8000 were only collected.
    d) Interest on Investments Rs. 2000 was collected by bank which was appeared in Passbook
    e) Bank Charges Rs 200 and interest on overdraft Rs 150 were debited in pass book.

(PTO)

19. The following trial balance was prepared by a clerk appointed newly by Rao & Company. Some errors were found in the Trial Balance due to lack of experience in preparing accounts. Prepare Trial Balance by rectifying these mistakes.

S.No	Particulars	Debit Rs.	Credit Rs.
	Opening Stock	5,000	
	Capital		60,000
	Discount allowed		500
	Discount received		700
	Fixed Assets		60,000
	Sales	85,000	
	Purchases		45,000
	Purchase returns		1,000
	Sales returns	2,000	
	Carriage inwards		600
	Carriage outwards		700
	Wages, Salaries	25,000	
	Bills receivable	7,000	
	Debtors	9,000	
	Bills Payable		7,000
	Rent	3,000	
	Interest Paid		2,000
	Cash	800	
	Creditors	6,900	
	Closing Stock	33,800	
		1,77,500	1,77,500

20. The following are the figures extracted from the Books of Krishna Murthy on 31-12-2018 ; Prepare Final Accounts :

	Debit Rs.	Credit Rs.
Capital		50,000
Plant & Machinery	20,000	
Furniture	11,500	
Sundry Debtors & Creditors	15,000	20,000
Bills Receivable & Payable	10,000	5,000
Opening Stock	20,000	
Purchases & Sales	60,000	90,000
Depreciation	1,200	
Outstanding Salaries		800
Salaries	10,000	
Wages	22,000	
Insurance	1,000	
Prepaid Insurance	100	
Carriage	400	
10% Loan		5,400
Total	1,71,200	1,71,200

Adjustments : (a) Write off Rs. 1,000 as Bad Debts and provide 5% on debtors for bad debts.
(b) Closing Stock was valued at Rs. 40,000.
(c) Allow 10% Interest on Capital.

Instruction to Paper Setter:
Paper Setter must select TWO Short Questions and TWO Essay Questions from Each Unit.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
III	C8	Object Oriented Programming through Java	4	60	4

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.

Course 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

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

Text Books:

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

Reference Books:

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)

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
III	C8-P	Object Oriented Programming through Java Lab	2	30	1

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.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
III	C9	Operating Systems	4	60	4

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.

Course 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.

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.

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UNIT- V

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

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.

Reference Books:

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.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
III	C9-P	Operating Systems Lab	2	30	1

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.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C10	Cyber Laws	4	60	4

Course Objectives:

1. Enable learners to understand, explore, and acquire a critical understanding of Cyber Law.
2. Develop competencies for dealing with frauds and deceptions (confidence tricks, scams) and other cyber-crimes for example, child pornography etc. that are taking place via the Internet.
3. Make learners conversant with the social and intellectual property issues emerging from 'Cyberspace'.
4. Explore the legal and policy developments in various countries to regulate Cyberspace.
5. Develop the understanding of relationship between commerce and cyberspace; and give learners in depth knowledge of Information Technology Act and legal frame work of Right to Privacy, Data Security and Data Protection.

Course Outcomes:

At the end of the course, students should be able to:
1. Critically evaluate ongoing developments in law relating to information technologies.
2. Display an understanding of how these developments relate to one another.
3. Examine areas of doctrinal and political debate surrounding rules and theories;
4. Evaluate those rules and theories in terms of internal coherence and practical outcomes.
5. Draw on the analysis and evaluation contained in primary and secondary sources.

UNIT- I

Introduction: Computers and its Impact in Society, Overview of Computer and Web Technology, Need for Cyber Law, *Cyber* Jurisprudence at International and Indian Level.

UNIT -II

Cyber Law- International Perspectives: UN &International Telecommunication Union (ITU)Initiatives, Council of Europe -Budapest Convention on Cybercrime, Asia-Pacific Economic Cooperation(APEC), Organization for Economic Co-operation and Development(OECD), World Bank, Commonwealth of Nations.

UNIT -III

Constitutional & Human Rights Issues in Cyberspace: Freedom of Speech and Expression in Cyberspace, Right to Access Cyberspace – Access to Internet, Right to Privacy, Right to Data Protection.

UNIT -IV

Cyber Crimes & Legal Framework: Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Cyber Pornography, Identity Theft & Fraud, Cyber terrorism, Cyber Defamation, Different offences under IT Act, 2000.

UNIT -V

Cyber Torts: Different Types of Civil Wrong sunder the IT Act, 2000, Intellectual Property Issues in Cyber Space, Interface with Copyright Law, Interface with Patent Law, Trade marks & Domain Names Related issues

Text Book:

1. Justice Yatindra Singh, Cyber Laws, Universal Law Publishing Co, New Delhi, (2012).

Reference Books:

2. Chris Reed & John Angel, Computer Law, OUP, NewYork,(2007).
3. Verma K, Mittal Raman, Legal Dimensions of Cyber Space, Indian Law Institute, NewDelhi,(2004)
4. Jonthan Rosenoer, Cyber Law, Springer, New York, (1997).
5. Sudhir Naib, The Information Technology Act, 2005: A Hand book, OUP, NewYork, (2011)
6. S.R.Bhansali, Information Technology Act,2000, University Book House Pvt. Ltd., Jaipur (2003).
7. Vasu Deva, Cyber Crimes and Law Enforcement, Common wealth Publishers, New Delhi,(2003).

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C10-P	Cyber Laws Lab	2	30	1

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 analyse the scenario and submit report citing cyber laws which are violated.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C11	Data Mining and Data Ware Housing	4	60	4

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.

Course 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.

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.

Text Book:

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

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C11-P	Data Mining And Data Ware Housing Lab	2	30	1

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.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C12	Web Programming	4	60	4

Course Objective

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.

Course Outcome

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.

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

Prescribed 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

Reference Books:

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.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C12-P	Web Programming Lab	2	30	1

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

Semester	Course Code	Course Title	Hours/ Week	Hours	Credits
IV	C13	Design of Object Oriented Applications	4	60	4

Course Objectives:

1. To teach the realistic application of object-oriented analysis and design within a variety of problem domain.

Course Outcomes:

By the end of the course, student will be able to:

1. Have Knowledge in micro and macro process.
2. Have Knowledge in management planning, quality assurance and metrics along with documentation of object oriented development.
3. Have Knowledge in system architecture.
4. Basic knowledge in AI and Data Acquisition.
5. Knowledge in applications of Object Oriented Design.

UNIT- I:

Process-First Principles: Traits of Successful Projects: Strong Architectural Vision, Iterative and Incremental Lifecycle. **The Macro Process:** The Software Development Lifecycle, Overview, The Macro Process Content Dimension-Disciplines, The Macro Process Time Dimension-Milestones and Phases, The Macro Process Time Dimension-Iterations, Release Planning.

The Micro Process: The Analysis and Design Process, Overview, Level of Abstraction, Activities, Products, The Micro Process and Level of Abstraction, Identifying Elements, Defining Elements of Collaborations, Defining Element Relationships, Detailing Element Semantics.

UNIT- II:

Pragmatics-Management Planning: Risk Management, Task Planning, Development Review. **Staffing:** Resource Allocation, Development Team Roles. **Release Management:** Configuration Management and Version Control, Integration, Testing. **Reuse:** Elements of Reuse, Institutionalizing Reuse. **Quality Assurance and Metrics:** Software Quality, Object-Oriented Metrics. **The Benefits and Risks of Object-Oriented Development:** The Benefits of Object Oriented Development, the Risk of Object Oriented Development.

UNIT- III:

System Architecture: *Satellite-Based Navigation*: Inception, Elaboration, Construction, Post- Transition.
Control System: *Traffic Management:* Inception, Elaboration, Construction, Post-Transition.

UNIT- IV:

Artificial Intelligence: *Cryptanalysis:* Inception, Elaboration, Construction, Post-Transition.
Data Acquisition: *Weather Monitoring station*: Inception, Elaboration, Construction, Post-Transition.

UNIT- V:

Web Application: *Vacation Tracking System:* Inception, Elaboration, Construction, Transition and Post-Transition.

Object-Oriented Programming Languages: Language Evolution, Smalltalk, C++, Java.

Text Book:

1. Object-Oriented Analysis and Design with Applications, 3rd Edition, By: Robert A. Maksimchuk, Bobbi J. Young, Grady Booch, Jim Conallen, Michael W. Engel, Kelli A. Houston, Pearson education.

Reference Books:

1. Grady Booch, Object Oriented Analysis and Design with Applications, 2rd Edition, Pearson education 1999.

2. Jacobson ed al., The Unified Software Development Process, A W 1999.

3. Tom Pender,UML Bible, John Wiley and sons.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C13-P	Design of Object Oriented Applications Lab	2	30	1

1. Develop a mini project for Satellite-Based Navigation.
2. Develop a mini project for Traffic Management.
3. Develop a mini project for Cryptanalysis.
4. Develop a mini project for Weather Monitoring Station.
5. Develop a mini project for Vacation Tracking System.

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C14	Data Analytics Using R	4	60	4

Course Objectives:

After completing the course, student will learn,

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

Course 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.

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.

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

Reference Books:

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

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C14-P	Data Analytics using R Lab	2	30	1

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

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C15	Object Oriented Software Engineering	4	60	4

Course Objectives:

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

Course 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.

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 to Objects: 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.

Text book:

Stephen R.Schach -Object Oriented Software Engineering McGraw Hill Higher Education

Reference book:

Timothy C.Lethbridge, Robert Language Object Oriented Software Engineering

Semester	Course Code	Course Title	Hours/Week	Hours	Credits
IV	C15-P	Object Oriented Software Engineering Lab	2	30	1

Design Following Systems in Object Oriented Approach using UML with open source tools (Eclipse UML2 or any other Open source tools):

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

Note: Student is expected to analyze the system in object oriented manner and design the system in object oriented approach using UML with open source tools

ALL SEMESTERS

MODEL QUESTION PAPER

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

SECTION-A

Answer any FIVE of the following Questions: **(5 x 5= 25 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 × 10 =50 Marks)**

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

REVISED UG SYLLABUS UNDER CBCS

(Implemented from Academic year 2020-21)

PROGRAMME: FOUR YEAR BCA

Domain: Bachelor Computer Applications (BCA)

Skill Enhancement Courses (SECs) for Semester V, from 2022-23

Semester – V

S. No.	Paper Code	Subject	Hours per week	Credits	Max. Marks		Total Marks
					Internal	External (University Exams)	
1	SEC-1	Machine Learning Using Python	4	3	25	75	100
	SEC-1P(Lab)	Python Lab	2	2	--	50	50
2	SEC-2	Digital Imaging	4	3	25	75	100
	SEC-2P(Lab)	Digital Imaging Lab	2	2	--	50	50
3	SEC-3	Cyber Security and Malware Analysis	4	3	25	75	100
	SEC-3P(Lab)	Cyber Security and Malware Analysis Lab	2	2	--	50	50
4	SEC-4	Internet of Things	4	3	25	75	100
	SEC-4P(Lab)	Internet of Things Lab	2	2	--	50	50
5	SEC-5	Mobile Application Development	4	3	25	75	100
	SEC-5P(Lab)	Mobile Application Development Lab	2	2	--	50	50
6	SEC-6	Computer Networking and PC trouble shooting	4	3	25	75	100
	SEC-6P(Lab)	Computer Networking and PC trouble shooting Labs	2	2	--	50	50
TOTAL			36	30	150	750	900

Note-1:*The Number of hours per week and credits are assigned to each course as per the course structure which was already approved at the time of finalizing the first FOUR semesters of BCA programme under CBCS by the concerned committee.*

Note-2: *One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate practical skills related to the domain subject in students. The syllabus of SEC will be skill oriented and hence, teachers shall impart practical training to students on the skills embedded in syllabus citing related real field situations.*

Note-3: *Since, the proposed SECs are connected to Computer Programming/Software Tools*

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and Skill enhancement, the students need to get exposure on the syllabus content by practicing on the computer. Faculty are advised to engage students in practical based assignments so as to ensure better understanding of the practical usage of the particular skill based subject in real application domain.

Semester-wise Revised Syllabus under CBCS, 2020-21
Domain Subject: BACHELOR OF COMPUTER APPLICATIONS
Semester –V
MACHINE LEARNING USING PYTHON
(Skill Enhancement Course, 3 credits)
Total Hrs: 60 Max Marks: 100

Course Educational Objective: The objective of the course provides the basic concepts and techniques of Machine Learning and helps to use recent machine learning software for solving practical problems. It enables students to gain experience by doing independent study and research.

Course Outcomes: At the end of this course, the student will be able to

CO1: Identify the characteristics of machine learning.**(Understand- L2)**

CO2: Summarize the Model building and evaluation approaches**(Understand- L2)**

CO3: Apply Bayesian learning and regression algorithms for real-world Problems.**(Apply- L3)**

CO4: Apply supervised learning algorithms to solve the real-world Problems. **(Apply- L3)**

CO5: Apply unsupervised learning algorithms for the real world data. **(Apply- L3)**

UNIT-I: Introduction to Machine Learning and Preparing to Model

Introduction to Machine Learning-Introduction, What is Human Learning? Types of Human Learning, What is Machine Learning? Types of Machine Learning, Problems Not To Be Solved Using Machine Learning, Applications of Machine Learning.

Preparing to Model-Introduction, Machine Learning Activities, Basic Types of Data in Machine Learning, Exploring Structure of Data, Data Quality and Remediation, Data Pre-Processing

UNIT-2: Modeling & Evaluation, Basics of Feature Engineering

Modeling & Evaluation-Introduction, Selecting a Model, Training a Model (for Supervised Learning), Model Representation and Interpretability, Evaluating Performance of a Model.

Basics of Feature Engineering-Introduction, Feature Transformation, Feature Subset Selection

UNIT-3: Bayesian Concept Learning and Regression

Bayesian Concept Learning - Introduction, Why Bayesian Methods are Important?, Bayes' Theorem, Bayes' Theorem and Concept Learning, Bayesian Belief Network.

Regression: Introduction, Regression Algorithms - Simple linear regression, Multiple linear regression, Polynomial Regression Model, Logistic Regression, Maximum Likelihood Estimation.

UNIT-4: Supervised Learning: Classification, Ensemble Learning

Classification-Introduction, Example of Supervised Learning, Classification Model, Classification Learning Steps, Common Classification Algorithms - k-Nearest Neighbour (kNN), Decision tree, Random forest model, Support vector machines.

Ensemble Learning- Boosting, Bagging

UNIT-5: Unsupervised learning

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Unsupervised Learning- Introduction, Unsupervised vs Supervised Learning, Application of Unsupervised Learning, Clustering –Clustering as a Machine Learning task, Different types of clustering techniques, Partitioning methods, Hierarchical clustering, Density-based methods: DBSCAN.

Finding Pattern using Association Rule - Definition of common terms, Association rule, Apriori algorithm.

Text Books:

1. Subramanian Chandramouli, SaikatDutt, Amit Kumar Das, "Machine Learning",Pearson Education India ,1st edition.
2. Tom M. Mitchell, "Machine Learning', MGH, 1997.

Reference Books:

1. Shai Shalev-Shwartz, ShaiBen David, "Understanding Machine Learning: From Theory to Algorithms", Cambridge.
2. Peter Harington, "Machine Learning in Action" , Cengage, 1st edition, 2012.
3. Peter Flach, "Machine Learning: The art and science of algorithms that make sense of data", Cambridge university press,2012.
4. Jason Brownlee, "Machine Learning Mastery with Python Understand Your Data, Create Accurate Models and Work Projects End-To-End",Edition: v1.4, 2011.

MACHINE LEARNING USING PYTHON LAB

1. EDA Analysis
2. Exploring Feature Selection Algorithms
   - Ranking
   - Wrapper methods
3. Dimensionality Reduction-PCA
4. Exploring Model Evolution Parameters.
5. Probabilistic Classification Algorithm
6. Regression Techniques: Linear, Logistic
7. Classification Techniques – Tree Based
8. Classification Techniques- Neural Network.
9. Ensemble Learning
10. Clustering &Apriori Algorithm.

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Semester-wise Revised Syllabus under CBCS, 2020-21
Domain Subject: BACHELOR OF COMPUTER APPLICATIONS
Semester –V
DIGITAL IMAGING
(Skill Enhancement Course, 3 credits)
Total Hrs: 60 Max Marks: 100

Course Objective:

Learn about different types of images and how to use basic and advanced features of GIMP Software for creating and image editing tools.

Course Learning Outcomes:

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

1. Gain knowledge about Types of Graphics, Types of Objects, Types of video editing tools
2. Show their skills in editing and altering photographs for through a basic understanding of the tool box.
3. Gain knowledge in using the layers.
4. Gain knowledge in using the selection tools, repair tools.
5. Gain knowledge in using selection tools , applying filters and can show their skills.

UNIT-I **12 HRS**

1.Types of Graphics
- 1.1 Raster vs Vector Graphics

2.Types of Objects
- 2.1 Audio formats
- 2.2 Video formats
- 2.3 Image formats
- 2.4 Text document formats

3. Types of video editing
4. Different color modes.
5. Image Scanner
   - 5.1 Types of Image Scanners

UNIT-II **12 HRS**

1.What is GIMP
2.GIMP tool box window
3.layers Dialog
4.Tool Options Dialog
5.Image window
6.Image window menus

UNIT-III **12 HRS**

Improving Digital Photos

1.1 Opening files
- 1.1.1 rescaling saving files

1.2.Cropping
1.3. Brightening & Darkening
1.4. Rotating
1.5. Sharpening

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1.6. Fixing Red Eye

Introduction to layers

2.What is layer

2.1.Using layer to add text
2.2.Using move tool
2.3.Changing colors
2.4.Simple effects on layers
2.5 Linking layers together
2.6 Performing operations on layers
2.7 Using layers to copy and paste
2.8 Tour of layers dialog

UNIT-IV **12 HRS**

Drawing:

1.1 Drawing lines and curves
1.2 Changing colors and brushes
1.3 Erasing
1.4 Drawing rectangles
1.5 Circles, other shapes
1.6 Outlining and filling regions
1.7 Filling with patterns and gradients
1.8 Importing brushes or gradients or making your own.

Selection:

2.1 Working with selections
2.2 Select by color and fuzzy
2.3 Select Bezier paths
2.4 Intelligent scissors tool
2.5 Modifying selections with selection modes

UNIT-V **12 HRS**

Erasing and Touching Up:

1.1 Dodge and burn tool
1.2 Smudging tool
1.3 Clone tool
1.4 Sharpening using convolve tool
1.5 Blurring with Gaussian Blur
1.6 Correcting Color Balance
1.7 Hue
1.8 Saturation
1.9 Color balance using curves and levels.

Filters:

2.1 Filters
2.1.1 Blur
2.1.2 Enhance
2.1.3 Distort
2.1.4 Noise Filters

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Text Book: Beginning GIMP From Novice to professional by Akkana Peck, Second Edition, Apress

Recommended Co-Curricular Activities (participation: total 15 weeks):

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. **General**

1. Group Discussion
2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Observation of practical skills,
5. Efficient delivery using seminar presentations,
6. Viva voce interviews.
7. Computerized adaptive testing, literature surveys and evaluations,
8. Peers and self-assessment, outputs form individual and collaborative work

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DIGITAL IMAGING LAB

(Number of Hours per week: 2, Credits: 2)

1. Designing a Visiting card
2. Design Cover page of a book
3. Paper add for calling tenders
4. Passport photo design
5. Design a Pamphlet
6. Brochure designing
7. Titles designing
8. Custom shapes creation
9. Black & white and color photo conversion
10. Image size modification
11. Background changes
12. Texture and patterns designing
13. Filter effects & Eraser effects

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Semester-wise Revised Syllabus under CBCS, 2020-21
Domain Subject: BACHELOR OF COMPUTER APPLICATIONS
Semester –V
Course: CYBER SECURITY AND MALWARE ANALYSIS
(Skill Enhancement Course, 3 credits)

COURSE OBJECTIVES:

The main objective of the course is to impart conceptual understanding on Cyber security and protection of electronic systems and information from malware attacks.

COURSE OUTCOMES:

Upon successful completion of this course, students should have the knowledge and skills to

1. Understand the computer networks, networking tools and cyber security
2. Learn about NIST Cyber Security Framework
3. Understand the OWASP Vulnerabilities
4. Implement various Malware analysis tools
5. Understand about Information Technology act 2000

UNIT-I: Introduction to Networks & cyber security **periods: 14**

- Computer Network Basics
- Computer network types
- OSI Reference model
- TCP/IP Protocol suite
- Difference between OSI and TCP/IP
- What is cyber, cyber-crime and cyber-security
- All Layer wise attacks
- Networking devices: router, bridge, switch, server, firewall
- How to configure: router
- How to create LAN
- Network tools
    - IP scanner
    - port scanner
    - vulnerability scanner
    - command tools-- netstack, traceroute, nslookup
    - tcpview

UNIT-II: NIST Cyber security framework **periods: 10**

- Introduction to the components of the framework
- Cybersecurity Framework Tiers
- What is NIST Cyber security framework
- Features of NIST Cyber security framework
- Functions of NIST Cyber security framework
- Turn the NIST Cybersecurity Framework into Reality/ implementing the framework

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UNIT-III: OWASP **periods: 14**

- What is OWASP?
- OWASP Top 10 Vulnerabilities
  - ❖ Injection
  - ❖ Broken Authentication
  - ❖ Sensitive Data Exposure
  - ❖ XML External Entities (XXE)
  - ❖ Broken Access Control
  - ❖ Security Misconfiguration
  - ❖ Cross-Site Scripting (XSS)
  - ❖ Insecure Deserialization
  - ❖ Using Components with Known Vulnerabilities
  - ❖ Insufficient Logging and Monitoring
- OWASP Juice Shop
- Web application firewall

UNIT-IV: MALWARE ANALYSIS **periods: 12**

- What is malware
- Types of malware
  - ❖ Keyloggers
  - ❖ Trojans
  - ❖ Ransome ware
  - ❖ Rootkits
- Antivirus
- Firewalls
- Malware analysis
  - ❖ VM ware
  - ❖ How to use sandbox
  - ❖ How to create virtual machine
  - ❖ Process explorer
  - ❖ Process monitor
  - ❖ SYS-internals Suite
  - ❖
- SOC-security operations controls - Solar winds (study the tools)
- Network intrusion detection
  - ❖ Wireshark
  - ❖ IDS
  - ❖ IPS
  - ❖ Snort

UNIT-V: CYBER SECURITY: Legal Perspectives **periods: 10**

- Cybercrime and the legal landscape around the world
- Indian IT ACT 2000 --Cybercrime and Punishments
- Weak areas of IT ACT 2000
- Challenges to Indian law and cybercrime scenario in India
- Amendments of the Indian IT Act

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Text books:

1. Computer Networks | Fifth Edition | By Pearson (6th Edition)|Tanenbaum, Feamster&Wetherall
2. Computer Networking | A Top-Down Approach | Sixth Edition | By Pearson | Kurose James F. Ross Keith W.
3. Cyber Security by SunitBelapure, Nina Godbole|Wiley Publications
4. TCP/IP Protocol Suite |Mcgraw-hill| Forouzan|Fourth Edition

Website References:

- https://csrc.nist.gov/Projects/cybersecurity-framework/nist-cybersecurity-framework-a-quick-start-guide
- https://owasp.org/www-project-top-ten/
- https://owasp.org/www-project-juice-shop/

Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)

2. Student seminars (on topics of the syllabus and related aspects (individual activity))

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))

4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

B. General

1. Group Discussion

2. Try to solve MCQ's available online.

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Practical assignments and laboratory reports,
4. Observation of practical skills,
5. Individual and group project reports.
6. Efficient delivery using seminar presentations,

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7. Viva-Voce interviews.
8. Computerized adaptive testing, literature surveys and evaluations,
9. Peers and self-assessment, outputs form individual and collaborative work

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CYBER SECURITY AND MALWARE ANALYSIS LAB

(Number of Hours per week: 2, Credits: 2)

COURSE OBJECTIVES:

The purpose of this course is to impart practical understanding on Cyber security and protection of electronic systems and information from malware attacks.

1. configure a LAN by using a switch
2. configure a LAN by using Router
3. steps to attack a victim computer by using "ProRat" trojan tool
4. Perform the packet sniffing mechanism by download the "wireshark" tool and extract the packets
5. Perform the task of creating mail messages by using fake mail id by using the "fake mailer" website (https://emkei.cz)
6. Perform the IP scanning mechanism by using "tracert"and "arp" commands
7. Perform the port scanning mechanism by using NMAP tool
8. Perform an SQL Injection attack and its preventive measure to avqid Injection attack
9. Perform an activity to access a locked computer without knowing the user's password.

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Semester-wise Revised Syllabus under CBCS, 2020-21
Domain Subject: BACHELOR OF COMPUTER APPLICATIONS
Semester – V
Course- *INTERNET OF THINGS*

(Skill Enhancement Course- 5 credits)
Total Hrs: 60 ax Marks: 100

Course description and objectives:
Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop communication system among heterogeneous components i.e. IOT Devices.

Course Outcomes:
* Able to understand various applications of IOT in real world and industry domain
* Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
* Able to understand building blocks of Internet of Things and characteristics.
* Able to design and develop IOT devices.

UNIT-1

1.1 IOT. Explain Characteristics and component of IOT.
1.2 Advantages and disadvantages of IOT.
1.3 various application areas of IoT.
1.4 Time for Convergence for IoT.
1.5 reasons to converge the technologies and shift to IOT.
1.6 smart parking IOT application using figure.
1.7 smart home IOT application using figure.
1.8 smart health using IoT.
1.9 Smart City application of IoT

UNIT-2

2.1 M2M Value Chains.
2.2 IoT architecture outline withdiagram.
2.3 IOT Value Chains using figure.
2.4 shifting from M2M to IoT.
2.5 design principles and needed capabilities of IOT.
2.6 I-GVC using figure.
2.7 Global Value Chain
2.8 M2M Value Chains.
2.9 IoT-Architecture.

UNIT 3:

3.1 ETSI M2M high-level architecture.
3.2 IOT referencemodel.
3.3 IOT function view.
3.4 IOT reference architecture's deployment and operational view.
3.5 reference architecture of IOT using figure.

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3.6 Functional View, Information View, Deployment and Operational View, Other Relevant architectural views of IOT reference architecture.
3.7 Architecture Reference Model of IOT using figure.
3.8 IoT Domain Model
3.9 Open Geospatial Consortium Architecture with a diagram.

UNIT 4

4.1 shopping basket can tell: IoT for retailing industry?
4.2 future factory concepts.
4.3 four aspects in your business to master IoT.
4.4 Needs of IoT for Oil and Gas Industry.
4.5 creation from big data and serialization.
4.6 challenges faced by industry related IoT Applications.
4.7 four Aspects in one's business to master IoT.
4.8 eHealth IOT applications.
4.9 security concerns for industry.
4.10 shopping basket can tell: IoT for retailing industry
4.11 future factory concepts.
4.12 IoT for Oil and Gas Industry
4.13 Smart factory.

UNIT 5

5.1 GAMBAS adaptive middleware.
5.2 smartie approach for IoT.
5.3 security, privacy and trust in IoT-Data-Platforms for smart cities
5.4 Data aggregation for the IoT in smart cities security.
5.5 contributions from FP7Projects.
5.6 smartie approach, properties and characteristics.
5.7 privacy-preserving sharing of IoTData.
5.8 activity chain - governance, privacy and security issues.

Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
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B. General

1. Group Discussion
2. Try to solve MCQ's available online.

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Practical assignments and laboratory reports,
4. Observation of practical skills,
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6. Efficient delivery using seminar presentations,
7. Viva-Voce interviews.
8. Computerized adaptive testing, literature surveys and evaluations,
9. Peers and self-assessment, outputs form individual and collaborative work

IoT Lab Experiments:

1. Define and Explain Eclipse IoT Project
2. List and summarize few Eclipse IoT Projects.
3. Sketch the architecture of IoT Toolkit and explain each entity in brief.
4. Demonstrate a smart object API gateway service reference implementation in IoT toolkit.
5. Write and explain working of an HTTP-to-CoAP semantic mapping proxy in IoT toolkit
6. Describe gateway-as-a-service deployment in IoT toolkit.
7. Explain application framework and embedded software agents for IoT toolkit.
8. Explain working of Raspberry Pi.
9. Connect Raspberry Pi with your existing system components.
10. Give overview of Zetta.

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Semester-wise Revised Syllabus under CBCS, 2020-21
Domain Subject: BACHELOR OF COMPUTER APPLICATIONS
Semester –V

MOBILE APPLICATION DEVELOPMENT

(Skill Enhancement Course , 3 credits)
Total Hrs: 60 Max Marks: 100

Course objectives:

1. Interpret the features of Android operating systems
2. Configure Android Environment and Development tools
3. Develop user interfaces by using layouts an controls
4. Develop rich user interface in the given view
5. Understand the security services and able to publish android application

Learning Outcomes:

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

CO 1. Identify basic terms ,tools and software related to android systems
CO 2. Describe components of IDE, understand features of android development tools
CO 3. Describe the layouts and controls
CO 4. Explain the significance of displays using the given view
CO 5. Explain the features of services and able to publish android Application
C0 6. Developing interesting Android applications using MIT App Inventor

UNIT-1 10 Hrs

1.1 Introduction to Android ,open headset alliance, Android Ecosystem
1.2 Need of Android
1.3 Features of Android
1.4 Tools and software required for developing an Application
1.5 Android architecture

UNIT-2 12 Hrs

2.1 operating system, java JDK, Android SDK
2.2 Android development tools
2.3 Android virtual devices
2.4 steps to install and configure Android studio and sdk

UNIT-3 14 Hrs

3.1 control flow, directory structure
3.2 components of a screen
3.3 fundamental UI design
3.4 linear layout, absolute layout , table layout, relative layout
3.5 text view
3.6 edit text
3.7 button, image button, radio button, toggle button
3.8 radio group, check box, and progress bar

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3.9 list view , grid view, image view , scroll view
3.10 time and date picker

UNIT-4 12 Hrs

4.1 android platform services
4.2 Android system Architecture
4.3 Android Security model
4.4 Applications development: creating small application

UNIT-5 12 Hrs

5.1 Introduction of MIT App Inventor
5.2 Application Coding
5.3Programming Basics & Dialog
5.4 More Programming Basics
5.5 Alarm Clock Application
5.6 Audio & Video
5.7 Drawing Application
5.8 File
5.9 Game
5.10 Device Location
5.11 Web Browsing

Text Books:

1. Erik Hellman, "Android Programming – Pushing the Limits", 1st Edition, Wiley India Pvt Ltd, 2014.
2. App Inventor : create your own Android apps by Wolber, David (David Wayne)

Reference Books:

1. Dawn Griffiths and David Griffiths, "Head First Android Development", 1st Edition, O'Reilly SPD Publishers, 2015.
2. J F DiMarzio, "Beginning Android Programming with Android Studio", 4th Edition, Wiley India Pvt Ltd, 2016. ISBN-13: 978-8126565580
3. Anubhav Pradhan, Anil V Deshpande, " Composing Mobile Apps" using Android, Wiley 2014, ISBN: 978-81-265-4660-2
4. Android Online Developers Guide
5. http://developer.android.com/reference/ Udacity: Developing Android
6. Apps- Fundamentals
7. https://www.udacity.com/course/developing-android-appsfundamentals--ud853-nd
8. http://www.appinventor.mit.edu/

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RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

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4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports.
5. Observation of practical skills,
6. Efficient delivery using seminar presentations,
7. Viva voce interviews.
8. Computerized adaptive testing, literature surveys and evaluations,
9. Peers and self-assessment, outputs form individual and collaborative work

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Mobile Application Development Lab

(Number of Hours Per week: 2, Credits: 2)

Course objectives:

1. know the components and structure of mobile application development framework for android
2. learn the basic and important design concepts
3. learn the development of mobile application

Outcomes:

1. Understand the android platform
2. Design and implementation of various mobile applications

Experiments:

1. Demonstrate mobile technologies and devices
2. Demonstrate Android platform and applications overview
3. Implement User interface design layouts
4. Working with texts , shapes, buttons and lists
5. Develop a calculator application
6. Implement an application that creates a alarm clock

Note: The list of experiments need not be restricted to the above list. *Detailed list of programming/software tool based exercises can be prepared by the concerned faculty members.*

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Semester-wise Revised Syllabus under CBCS, 2020-21
Domain Subject: COMPUTER APPLICATIONS
Semester – V
Course-PC HARDWARE AND NETWORKING
(Skill Enhancement Course (Elective), 5 credits)
Total Hrs: 60 Max Marks: 100

Course objectives:

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

CO 1. Identify the computer peripherals, software and hardware devices.
CO 2. Describe the basics of networks and networking tools
CO 3. Describe the Network Addressing and sub-netting
CO 4. Explains the Networks protocols and management
CO 5. Identifies Basic Network administrator roles

UNIT-1Introduction to computer hardware

1.1Introduction & Definition of Computer
1.1.1 Block Diagram of computer
1.1.2Classification of computer
1.1.3 Characteristics of Computers
1.1.4Types of Languages and language translators.
1.1.5 History and Generation of computers, Memory - Bits, Bytes, KB,MB,GB,TB,PB,EB,ZB,YB,Brontope byte, Geeope Byte. Etc
IEC Units: kibi, mebi,gibi,tebi,pebi,exbi,zebi,yobi
1.1.6Computer Software, Types of Software with Ex. (System/Application/Utility S/W
1.1.7 Computer Hardware- Intro. to Hardware components of computer
1.2. Components and its parts
1.2.1.Identifying the Important Hardware Components of PC.- CPU, Motherboard, RAM, HDD, ODD, SMPS, K/B, Mouse, Monitor (CRT,LCD,LED) etc
1.3. SMPS
1.3.1About SMPS
1.3.2 Types of SMPS
1.3.3 Power stored in UPS
1.3.4 Components and Circuits inside the SMPS Unit
1.4 UPS (Uninterrupted Power Supply)
1.4.1Types of UPS.(Offline/Line Interactive & Online)
1.4.2 Working Principle of each type of UPS.
1.4.3 Connecting, Maintenance and Troubleshooting.

UNIT-2 Computer management and servicing

2.1 Assembling and dissembling PCs
2.2 Introduction to BIOS / CMOS Setup, POST (Power On SelfTest)
2.1.1Introduction to BIOS/CMOS Setup, POST (Power On Self-Test

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2.1.2 Demonstration of BIOS/CMOS Configuration (Date, Time, Enable/Disable Devices).

2.1.3 Dual BIOS Feature

2.1.4 BIOS/CMOS Setup, Booting Sequence/Boot Order

2.3 Introduction to Operating System

2.3.1Definition and types of Operating Systems - MSDos, Windows 9x/XP/Vista/7/8, Linux, MAC OS, Android etc.

2.3.2 Process of Booting the Operating System.

2.3.3 Win XP/Win 7. Activation and Automatic Updating procedures.

2.4 Computer Management

2.4.1 Computer Management, Disk Management, Defragmentation,

2.4.2 Services and Applications,

2.4.3 local Users and Groups

2.4.4 Advanced System Settings

2.4.5 Device Manager, Task Manager, Windows Registry

2.5 Partitioning

2.5.1 Partitioning of Hard Drive - Primary, Extended, Logical partitions using Partition Tools.

UNIT-3 Overview of Networking

3.1 Overview of Networking

3.2 Classification of Networks–LAN, MAN, WAN

3.3 Hardware and Software Components, Wi-Fi, Bluetooth

3.5 Network Communication Standards.

3.6 NETWORKING MODEL -OSI Reference Model, TCP/IP Reference Model

3.7 LAN Cables, Connectors, wireless network adapter

3.8 Wireless network adapter

3.9 Functions of LAN Tools

3.9.1 Anti-Magnetic mat

3.9.2 Anti-Magnetic Gloves

3.9.3 Crimping Tool

3.9.4 Cable Tester

3.9.5 Cutter

3.9.6 Loop back plug

3.9.7 Toner probe

3.9.8 Punch down tool

3.9.9 Protocol analyzer

3.9.10 Multi meter

3.10 Network Topologies

2.7.1 Bus

2.7.2 Ring

2.7.3 Star

2.7.4 Mesh

2.7.5 Hybrid Topologies

UNIT- 4 Network Addressing and sub-netting

4.1 Network Addressing.

4.2 TCP/IP Addressing Scheme

4.3 Components of IP Address and classes

4.4 Sub-netting

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4.5 Internet Protocol Addressings - IPv4 ,IPv6
4.6 Classful addressing and classless addressing

UNIT-5 Networks protocols and management

5.1 protocols in computer networks
5.2. Hyper Text Transfer Protocol(HTTP)
5.2.1 File Transfer Protocol(FTP)
5.2.2 Simple Mail Transfer Protocol(SMTP)
5.2.3address Resolution Protocol(ARP)
5.2.4 Reverse Address Resolution Protocol(RARP)
5.3. Telnet, ICMP
5.4. Simple Network Management Protocol(SNMP)
5.5. DHCP, DNS
5.6 Network Management.
5.7 Network Monitoring and Troubleshooting.
5.8 Remote Monitoring (RMON)

Text Book:

1. "Introduction to Data Communications and Networking", B. Forouzan,TataMcGrawHill

2. "Computer Networks", Tanenbaum, PHI,

3. PC AND CLONES Hardware, Troubleshooting and Maintenance B. Govinda rajalu, Tata Mc-graw-Hill Publication

Reference Books:

1. PC Troubleshooting and Repair Stephen J. Bigelow Dream tech Press, New Delhi
2. "Data and Computer Communications", Stallings, PHI,
3. "DataCommunication", William Schewber, McGrawHill,1987
4. IT essential V7 companion guide – Cisco Networking Academy 2020
5. Upgrading and repairing PCs(22nd edition) – Scott Mueller – 2015 Que

Lab experiments

Course objectives:

To train the officials to acquire basic knowledge in computer hardware and peripherals for installation, PC assembly, trouble shooting and maintenance including system management and its backup and to undertake disaster prevention, a basic knowledge of TCP/IP networks work group, internet and intranet.

Outcomes:

The student will able to know the Basic of Computer assembling and trouble shooting. This course will provide the brief knowledge of Computer networking and trouble shooting

Experiments:

1. Introduction to PC Hardware and its pheripherals
2. Hardware installation and configuration

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3. PC Debugging, troubleshooting andbasic preventive maintenance
4. Assembling and Dissembling of a Computer System
5. Preparation of Boot disk or USB drive (demo)
6. Software installation and Configuration with CD/DVD or USB drive
7. Installation of commonly used software (Office Suites, Virus Scanners & Utilities)
8. Printer Installation & Print Test Page (Demo)
9. Installation of Web cam and tools like zoom/Edx/Microsoft teams (optional) for online class
10. Identifying network componentsand devices (hub, Switch and router)
11. Cables – Coaxial and UTP and it connectors/Jacks and preparation of a patch cord
12. Networking Basic and Configuration
13. Run All Types of Network Troubleshooting Commands
    (ipconfig, ping, traceroute etc)
14. installation and configuring the proxy server for internet access
15. Exercise on Setting of particular IP address (static) to an existing terminal system
16. Exercise on Installation of network operating system
17. Exercise on Configuration of DHCP and DNS.
18. Exercise on File/Folder accessing rights for sharing and printer sharing
19. Exercise on remote desktop
20. Exercise on setting up of VPN on network
21. Design a network with Cisco Packet tracer 8.0 (freely downloadalbe)
    a. Simple network with one server with five desktops (configure static IP addresses)
    b. Adding and removing network cards in a PC or server
    c. Design a Network with one DHCP server with 5 desktops
    (Try exercises 13,16 and 17 using Cisco packet tracer)

Tools required for PC assembling and software installation

1. Multimeter - 1Rs 500/ basic version

or

Digital voltage tester – 1 Rs 150 (taparia)

2. Earth checking plug – 1 Rs 350 (Mx)
3. Mother board diagnosis card -1 Rs 400/-
4. SMPS power supply tester - 1 Rs 400/-
5. Screw driver kit – 4 Nos Rs 40 each
6. External CD/DVD writer – 1 Rs 2000/-
6. Media for operating system (CD/DVD) or USB drive
(Try with trial versions for windows) or Ubuntu desktop(Linux)

Note : Un used old desktops can be used for installation

Tools Required for Network

1. RJ45 crimp tool – 1 Rs 250/- basic model
2. Cable tester - 1 Rs 350/-
3. Rj45 jacks - 100 nos Rs 250(ordinary) - consumables
4. UTP cable - 10 mts for each class Rs 20 per metre - consumables

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Structure of Programme under Revised CBCS

Semester-wise Syllabus under CBCS (w.e.f. 2020-21 Admitted Batch)

Semester

QUESTION PAPER PATTERN FOR END SEMESTER EXAM UG

CBCS SEMESTER PATTERN

Time: 3 Hours Max. Marks: 75

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SECTION-A

Answer any FIVE of the following Questions: (5 x 5= 25 Marks)

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

SECTION - B

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

11.
12.
13.
14.
15.
16.
17.
18.
19.
20.

Note: Paper Setter must select TWO Short Questions and TWO Essay Questions from Each Unit

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