Scheme and Syllabus
for
Diploma in ComputerApplication (DCA)
In
Open and Distance Learning Mode (ODL)

Directorate of Distance Education
Guru Jambheshwar University of Science & Technology
Hisar - 125001

Eligibility: 10+2 or equivalent in any stream with passing marks.

SCHEME FOR DCA
(DIPLOMA IN COMPUTER APPLICATION)

Semester - I

Paper Code	Nomenclature of Paper	Credits	Internal Assignments Marks	External Marks	Max. Marks
DCA-11-T	Problem Solving Using C	3	30	70	100
DCA-12-T	PC Software	3	30	70	100
DCA-13-T	Web Designing	3	30	70	100
DCA-14-T	Operating System	3	30	70	100
DCA-15-T	Object Oriented Programming Using C++	3	30	70	100
DCA-16-P	Problem Solving Using C Lab	2	30	70	100
DCA-17-P	PC Software Lab	2	30	70	100
DCA-18-P	Web Designing Lab	3	30	70	100
Total		**22**	**240**	**560**	**800**

Semester – II

Paper Code	Nomenclature of Paper	Credits	Internal Assignments Marks	ExternalMarks	Max. Marks
DCA-21-T	Data Structures and Algorithms	3	30	70	100
DCA-22-T	Data Analytics	3	30	70	100
DCA-23-T	Database Management System	3	30	70	100
DCA-24-T	Python Programming	3	30	70	100
DCA-25-T	Communication Skills and Personality Development	3	30	70	100
DCA-26-P	Database Management System Lab	3	30	70	100
DCA-27-P	Python Programming Lab	2	30	70	100
DCA-28-MP	Major Project	6	30	70	100
Total		26	240	560	800

Vinod

Semester I

PROBLEM SOLVING USING C

General Course Information

Course Code: DCA-11-T Course Credits: 3 Mode: Lectures (L) Maximum Marks: 100 Minimum Pass marks: 40 Examination Duration: 3 hours	**Course Assessment Methods (internal: 30; external: 70)** **NOTE:** Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks.

Pre-requisites: Brief knowledge of Computer Fundamentals and Computer hardware & software.

About the Course

Programming for problem Solving is a basic and important for every student of this course. This course introduces basic constructs of programming language like algorithms, conversion of algorithms to programs etc. By studying this course students will get to know about C programming language with its various programming paradigms like branching, looping, arrays, functions, recursion, structure, pointers, etc. to be implemented for solving real world problems. It includes various sorting and searching algorithms as well with notion of order of complexity through simple programs

Course Outcomes: By the end of the course students will be able to:

CO1. **Describe** the algorithms to programs (in C language) to test and execute the programs and correct syntax and logical errors.

CO2. **Demonstrate** the use of conditional branching, iteration and recursion.

CO3. **Apply** programming to solve matrix addition and multiplication problems and searching and sorting problem, apply programming to solve simple numerical method problems, namely root finding of function, differentiation of function and simple integration.

CO4. **Compare** the suitability of arrays, pointers and structures to formulate algorithms and programs for various problem situations

CO5. **Justify** a problem into functions and synthesize a complete program using divide and conquer approach.

Course Content

Unit - 1

Introduction to algorithms, Flow charts, Tracing flow charts, Problem solving methods, Need of computer languages, Reading programs written in C language, C character set, Identifiers and Keywords, Data types, Declarations, Expressions, statements and symbolic constants, Input- Output: getchar, putchar, printf, gets, puts functions. Preprocessor commands, #include Define, ifdef, preparing and running a complete C program.

Unit - 2

Operators and expressions, Arithmetic, Unary, Logical, bit-wise, assignment and conditional operators, Library functions, Control statements, While, do-while, for statements, nested loops, ifelse, switch, break, continue and goto statements, comma operators.

Unit - 3

Functions: Defining and accessing: Passing arguments, Function prototypes, Recursion, Use of library functions, Storage classes: Automatic, external and static variables, Arrays: Defining andprocessing, Passing to a function, Multidimensional arrays, Strings, operations on strings.

Unit - 4

Pointers: Declarations, Passing to a function, Operations on pointers, Pointer and arrays, Arrays of pointers.

Structures: Defining and processing, passing to a function, Union. Data Files: Open, close, create, process, Unformatted data files.

Text and Reference Books:

1. Hutchison R R, "Programming in C", Tata McGraw Hill, New York, 1990.
2. Johnsonbaugh R, and Kalin M, "Applications Programming in C" MacMillian. N.Y. 1990.
3. Kernighan B.W. and Ritchies D.M. "The C Programming Language" Prentice Hallof India, 1989.
4. E. Balaguruswamy, "Introduction to ANSI C", Tata McGraw Hill. 2008
5. Yashwant Kanetkar, "Let us C", BPB Publications. 2017

PC SOFTWARE

General Course Information

Course Code: DCA-12-T Course Credits: 3 Mode: Lectures (L) Maximum Marks: 100 Minimum Pass marks: 40 Examination Duration: 3 hours	**Course Assessment Methods (internal: 30; external: 70)** **Note**: Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks.

Pre-requisites: Basic knowledge of MS Windows, MS-Office.

About the Course

PC software is an essential course which basic computer operating system MS Windows and documentation in computer and their use in real world problems. It includes various documentation concepts, methodologies and different styles as well. These concepts are essential for students to solve problems in operating system and documentation related to engineering fields.

Course Outcomes: By the end of the course students will be able to:

CO1. **Describe** fundamental concepts of MS Windows operating system and a broad perspective about the use of windows in computer engineering industry.

CO2. **Demonstrate** concepts related to MS Windows, MS-Word, MS-Excel and MS-PowerPoint.

CO3. **Apply** the Concept of MS Windows, MS-Word, MS-Excel and MS- PowerPoint to solve the real world problems.

CO4. **Compare** the suitability of MS-Word, MS-Excel and MS-PowerPoint and prescribed operations for various problem situations.

CO5: **Design** documents for a given problem statement to implement and develops the basic concepts and terminology of MS Windows, MS-Word, MS-Excel and MS-PowerPoint in general.

COURSE CONTENTS

UNIT-I

MS Windows: Operating system- Definition and functions, basics of Windows, Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel- display properties, adding and removing software and hardware, setting date and time, screen saver and appearance.

UNIT-II

Documentation using MS-Word- Introduction to Office Automation, Creating and Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark. Advance Features of MS-Word-Mail Merge, Macros, Tables, Printing, Styles, linking and embedding objects, Template.

UNIT-III

Electronic Spreadsheet using MS-Excel: Introduction to MS-Excel, Creating and Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Excel-Pivot table and Pivot Chart.

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Charts, Word Art, Layering art objects, Animations and Sounds.

UNIT-IV

Computer Network: Uses, Topologies, OSI and TCP/IP Reference Models; Network categories: LAN, MAN, WAN.

Networking Devices: Hubs, Repeaters, Bridges, Modems, Switches, Routers, and Gateways.

Introduction to Internet: working concepts, Architecture, DNS, Email, WWW, Internet Ethics, Internet Security.

Text and Reference Books:

1. Microsoft Office- Complete Reference- BPB Publications. 2016
2. Learn Microsoft Office- Russell A. Stultz- BPB Publications. 1997
3. Courter, G Marquis, Microsoft Office 2000: Professional Edition. BPB. 1999
4. Koers, D, Microsoft Office XP Fast and Easy. PHI. 2001
5. Douglas E. Comer, "Computer Networks and Internets", Pearson Education Asia. 2001

WEB DESIGNING

General Course Information

Course Code: DCA-13-T **Course Credits:** 3 **Mode: Lectures (L)** **Maximum Marks:** 100 **Minimum Pass marks:** 40 **Examination Duration:** 3 hours	**Course Assessment Methods (internal: 30; external: 70)** **Note**: Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks.

Pre-requisites: Basic knowledge of HTML, XML, Java Script and CSS.

About the Course

This course includes a detailed coverage of HTML. Students learn HTML, XML and design various web pages using Java Script. They study about Client Side Programming and Server Side Programming.

Course Outcomes: By the end of the course students will be able to:

CO1. **Describe** Web Designing Complete Process
CO2. **Discuss** Client Side and Server Side Programming.
CO3. **Apply** Stylesheets with HTML in web design.
CO4. **Contrast** All Markup Languages.
CO5. **Design** Web Pages using HTML and XML.

COURSE CONTENTS

UNIT- I

Introduction to Internet and World Wide Web; Evolution and History of Word Wide Web; Basic features; Web Browsers; Web servers; Hypertext Transfer Protocol; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools;

UNIT- II

Web Publishing: Hosting your Site; Internet Services provider; Planning and designing yourWeb Site; Steps for developing Your site; Choosing the contents; Home page; Domain Names;

UNIT- III

Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts;

UNIT- IV

Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and layouts; Working with Forms and menus; Working with Radio buttons; Checks Boxes; Text Boxes;

XML Basic, Document type definition.

Text and Reference Books:

1. Raj Kamal, "Internet and Web Technologies", Tata McGraw- Hill. 2017
2. Ramesh Bangia, "Multimedia and Web Technologies", Firewall Media. 2007
3. Thomas A. Powell, "Web Design: The complete Reference", Tata McGraw- Hill. 2003
4. Wendy Willard, "HTML Beginners Guide", Tata McGraw- Hill. 2010
5. Deitel and Goldberg, "Internet and World Wide Web, How to Program", PHI. 2020

OPERATING SYSTEM

General Course Information

Course Code: DCA-14-T **Course Credits**: 3 **Mode: Lectures (L)** **Maximum Marks:** 100 **Minimum Pass marks**: 40 **Examination Duration**: 3 hours	**Course Assessment Methods (internal: 30; external: 70)** **Note**: Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks.

Pre-requisites: Programming in C and knowledge of computer fundamentals.

About the Course

The objective of this course is to help students become familiar with the fundamental concepts of operating systems and provide them with enough understanding of operating system design.

Course Outcomes: By the end of the course students will be able to:

CO1. **List** various functions and design characteristics of operating systems
CO2. **Explain** fundamental concepts of operating systems.
CO3. **Apply** operating system design concepts for solving problems regarding scheduling, memory management, disk management and deadlocks etc.
CO4. **Analyze** the issues related to various operating systems.
CO5. **Design** solutions for the memory and process management problems.

COURSE CONTENTS

UNIT-I

Introductory Concepts: Operating systems functions and characteristics, operating system services and systems calls, system programs, operating system architecture, operating system services and systems calls. Types of Operating systems.

UNIT-II

Processes: Process concept, Process Control Block, Operations on processes, cooperating processes. CPU scheduling: Levels of Scheduling, scheduling criteria, Comparative study of scheduling algorithms,

UNIT-III

Storage Management: Storage allocation methods: Single contiguous allocation, non-contiguous memory allocation, Paging and Segmentation techniques, segmentation with paging, Virtual memory concepts, Page replacement, Thrashing.

UNIT-IV

Deadlock: System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock

TEXT AND REFERENCE BOOKS:

1. Silberschatz, Peter B. Galvin and Greg Gagne, Operating System Concepts, 8th Edition, WileyIndianEdition, 2010.
2. Andrew S Tanenbaum, Modern Operating Systems, Third Edition, Prentice Hall India, 2008.
3. Naresh Chauhan, Principles of Operating Systems, Oxford Press, 2014.
4. D.M. Dhamdhere, Operating Systems, 2nd edition, Tata McGraw Hill, 2010.
5. William Stallings, Operating Systems– Internals and Design Principles, 5th Edition, Prentice HallIndia, 2000.

OBJECT ORIENTED PROGRAMMING USING C++

General Course Information

Course Code: DCA-15-T **Course Credits**: 3 **Mode: Lectures (L)** **Maximum Marks:** 100 **Minimum Pass marks**: 40 **Examination Duration:** 3 hours	**Course Assessment Methods (internal: 30; external: 70)** **Note:** Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks.

Pre-requisites: Knowledge of computer fundamentals and problem-solving using C programming

About the Course

Objected Oriented Programming using C++ is an essential course for every student in diploma of Computer Science and Engineering. This course introduces the Object Oriented concepts such as data encapsulation, data hiding, data abstraction, reusability, exception handling etc., and their implementation using C++.

Course Outcomes: By the end of the course students will be able to:

CO1. **List** the concepts related to object oriented paradigms.
CO2. **Distinguish** between structured and object oriented approaches to programming.
CO3. **Apply** object oriented constructs for problem solving.
CO4. **Detect** logical and run time errors and suggest appropriate modifications.
CO5. **Justify** the design of a program for a given problem.
CO6. **Design** solutions to programming problems using multiple object oriented programming constructstogether.

COURSE CONTENTS

UNIT-I

Introduction to object oriented programming, C++ standard library, OOPs concepts. Structure of class and struct in memory, accessing members of structures, Class scope and accessing class members, pre-processors directives, macro programs, header files and namespaces, constructors, chained constructor, default arguments with constructors, constant object and const member functions, function overloading.

UNIT-II

Inline function, friend function and classes, using this pointer, dynamic memory allocation with new and delete, static class members, polymorphism concepts, overloading, overriding methods, abstract classes, reusability, class's behaviors, inheritance, base classes and derived classes, protected members, inheritance way, using constructors and destructors in derived classes, composition vs. inheritance.

UNIT-III

Virtual functions, abstract base classes and concrete classes, virtual destructors, fundamentals of operator overloading, I/O Streams, files handling, creating a sequential access file, reading data from a sequential access file, updating sequential access files, random access files, reading data sequentially from a random-access file.

UNIT-IV

Managing Console I/O, stream input/output classes and objects, stream output, stream input, unformatted I/O (with read and write), stream manipulators, exception handling, basics of C++ exception handling(try, throw, catch), rethrowing an exception, specific exception, exception handling in constructors and destructors, function templates, overloading template functions, class template, container, iterator, algorithm and functional classes.

Text and Reference Books:

1. H. M. Deitel and P. J. Deitel, C++ How To Program, 6th Ed., Prentice Hall, 2008.
2. Robert Lafore, Object-Oriented Programming in C++, 3rd Ed., Sams Publishing, 2001.
3. D. Ravichandran, Programming with C++, 3rd Ed., T.M.H, 2011.
4. E. Balagurusamy, Object oriented Programming with C++, 6th Ed., Tata McGraw-Hill, 2013.
5. Horstmann, Computing Concepts with C++ Essentials, 3rd Ed., John Wiley, 2003.
6. Herbert Schildt , The Complete Reference in C++, 5th Ed., TMH, 2012.

Problem Solving Using C Language Lab

General Course Information

Course Code: DCA-16-P Course Credits: 2 Mode: Lectures (L) Maximum Marks: 100 Minimum Pass marks: 40	**Course Assessment Methods (internal: 30; external: 70)** **Note** The internal and external assessment is based on the levelof participation in lab. sessions and the timely submission of lab experiments/assignments, the quality of solutions designed for the assignments, the performance in VIVA-VOCE, the quality of lab. file and ethical practices followed. The internal examination is conducted by the coursecoordinator. The external examination is conducted by external examiner appointed by the Controller of Examination in association with the internal examiner appointed by the Chairperson of the Department.

Pre-requisites: Basic knowledge of computer related concepts.

About the course:

The lab course provides the opportunity to students to solve problems using C language. This includes implementing the concepts of various types of operators, looping, arrays, classes and pointers. The lab assignments are evenly spread over the semester. Every student is required to prepare a file of laboratory experiments done.

Course Outcomes: By the end of the course students will be able to:

CO1. **Implement** various C problems using various concepts of C for problem solving.
CO2. **Analyze** the syntax and logical errors in C programs.
CO3. **Evaluate** problem-solving and programming skills using C concept.
CO4. **Design** an object-oriented solution to solve a real-life problem.
CO5. **Create** a lab record of assignments including problem definitions, design of solutions and conclusions.
CO6. **Demonstrate** ethical practices and solve problems individually or in a group.

List of Experiments/Assignments

1. Understand the logic for a given problem.
2. Write the algorithm of a given problem.
3. Draw a flow chart of a given problem.
4. Recognize and understand the syntax and construction of C programming code.
5. Gain experience of procedural language programming.
6. Know the steps involved in compiling, linking and debugging C code.
7. Understand using header files.
8. Learn the methods of iteration or looping and branching.
9. Make use of different data-structures like arrays, pointers, structures and files.
10. Understand how to access and use library functions.
11. Understand function declaration and definition.
12. Understand proper use of user defined functions.
13. Write programs to print output on the screen as well as in the files.
14. Apply all the concepts that have been covered in the theory course.
15. Know the alternative ways of providing solution to a given problem.

Note: The actual experiments/assignments will be designed by the course coordinator. One assignment should be designed to be done in groups of two or three students. The assignments must meet the objective of the course and the levels of the given course outcomes. The list of assignments and schedule of submission will be prepared by the course coordinator at the beginning of the semester.

PC Software Lab

General Course Information

Course Code: DCA-17-P Course Credits: 2 Mode: Lab practice and assignments Maximum Marks: 100 Minimum Pass marks: 40	**Course Assessment Methods (internal: 30; external: 70)** The internal and external assessment is based on the level of participation in lab. Sessions and the timely submission of lab experiments/assignments, the quality of solutions designed for the assignments, the performance in VIVA-VOCE, the quality of lab. File and ethical practices followed. The internal examination is conducted by the coursecoordinator. The external examination is conducted by external examiner appointed by the Controller of Examination in association with the internal examiner appointed by the Chairperson of the Department.

Pre-requisites: Basic knowledge of computer.

About the Course:
This lab course on PC software involving learning of overall basics functionalities and operating system services. It also includes office automation activities related to our daily life uses of computer. Here the students will learn about various applications of MS Office.

Course Outcomes: By the end of the course students will be able to:

CO1. **Use** keyboard shortcuts to perform tasks.
CO2. **Create** a new document, open, save and print a document.
CO3. **Edit** and format text, change the page layout, background and borders.
CO4. **Modify** power point custom template presentation.
CO5. **Insert** clip art and pictures to documents
C06. **Navigate** the start menu to locate programs, files and settings and create files and folders.
C)7. **Create** a word document with customized template.

List of experiments/assignments

1. Write down the step to create user account in Window.
2. Write down the step to add printer in window.
3. Write down the step to page setup, print preview and print any document file in MS-Word.
4. Write down the step to insert, select, delete, merge, split and sort table in MS-Word.
5. Write down the step to create Mail Merge in MS-Word.
6. Apply the creating, editing, saving, printing securing and protecting operations to an excel spreadsheets.
7. Prepare a bar chart and pie chart for analysis of five year results of your institute.
8. Work on the following exercise on a Workbook:
   a) Copy an existing sheet
   b) Rename the old sheet
   c) Insert a new sheet into an existing Workbook.
   d) Delete the renamed sheet

PC Software Lab

General Course Information

Course Code: DCA-17-P Course Credits: 2 Mode: Lab practice and assignments Maximum Marks: 100 Minimum Pass marks: 40	**Course Assessment Methods (internal: 30; external: 70)** The internal and external assessment is based on the level of participation in lab. Sessions and the timely submission of lab experiments/assignments, the quality of solutions designed for the assignments, the performance in VIVA-VOCE, the quality of lab. File and ethical practices followed. The internal examination is conducted by the coursecoordinator. The external examination is conducted by external examiner appointed by the Controller of Examination in association with the internal examiner appointed by the Chairperson of the Department.

Pre-requisites: Basic knowledge of computer.

About the Course:
This lab course on PC software involving learning of overall basics functionalities and operating system services. It also includes office automation activities related to our daily life uses of computer. Here the students will learn about various applications of MS Office.

Course Outcomes: By the end of the course students will be able to:

CO1. **Use** keyboard shortcuts to perform tasks.
CO2. **Create** a new document, open, save and print a document.
CO3. **Edit** and format text, change the page layout, background and borders.
CO4. **Modify** power point custom template presentation.
CO5. **Insert** clip art and pictures to documents
C06. **Navigate** the start menu to locate programs, files and settings and create files and folders.
C)7. **Create** a word document with customized template.

List of experiments/assignments

1. Write down the step to create user account in Window.
2. Write down the step to add printer in window.
3. Write down the step to page setup, print preview and print any document file in MS-Word.
4. Write down the step to insert, select, delete, merge, split and sort table in MS-Word.
5. Write down the step to create Mail Merge in MS-Word.
6. Apply the creating, editing, saving, printing securing and protecting operations to an excel spreadsheets.
7. Prepare a bar chart and pie chart for analysis of five year results of your institute.
8. Work on the following exercise on a Workbook:
   a) Copy an existing sheet
   b) Rename the old sheet
   c) Insert a new sheet into an existing Workbook.
   d) Delete the renamed sheet

9. Create a excel worksheet and perform computations using available data and using mathematical functions chosen from menus.
10. Prepare an attendance sheet of 10 students for any 5 subjects of your syllabus. Calculate their total attendance, total percentage of attendance of each student and average of attendance in next worksheet.
11. Create a worksheet on students list of any 4 faculties and perform following database functions on it.
    a) Sort data by Name
    b) Filter data by Class
    c) Subtotal of number of students by class.
12. Apply themes and layouts to power point slides and insert pictures, graphics, shapes, and tables into presentations.
13. In power point slide make use of adding transitions and animations and working with master slides.
14. How to create Master slide for presentation.
15. Do experiments with some basic internet related DOS commands.

Note: The actual experiments/assignments will be designed by the course coordinator. One assignment should be designed to be done in groups of two or three students. The assignments must meet the objective of the course and the levels of the given course outcomes. The list of assignments and schedule of submission will be prepared by the course coordinator at the beginning of the semester.

Web Designing Lab

General Course Information

Course Code: DCA-18-P Course Credits: 2 Mode: Lab practice and assignments Maximum Marks: 100 Minimum Pass marks: 40	**Course Assessment Methods (internal: 30; external: 70)** The internal and external assessment is based on the level of participation in lab. Sessions and the timely submission of lab experiments/assignments, the quality of solutions designed for the assignments, the performance in VIVA-VOCE, the quality of lab. File and ethical practices followed. The internal examination is conducted by the coursecoordinator. The external examination is conducted by external examiner appointed by the Controller of Examination in association with the internal examiner appointed by the Chairperson of the Department.

Pre-requisites: Basic programming skills and knowledge of surfing internet.

About the Course:

This lab course on web development involves learning web-based programming languages. It incorporates the development of web pages by structuring information provided for the website design. The objective of the lab course is to equip the students to design web pages using modern web development tools.

Course Outcomes: By the end of the course students will be able to:

CO1. **Implement** object models for website design using modern tools like HTML, XML andJAVA scripting etc.
CO2. **Study** the design of websites.
CO3. **Test** the design of websites.
CO4. **Design** websites that consider socio-cultural values.
CO5. **Create** a written report for website designed.
CO6. **Use** ethical practices and socio-cultural values while designing websites.

List of experiments/assignments

1. Create a simple webpage using HTML.
2. Designing of registration form with table and use of hyperlink.
3. Design a page with frames to include Images and Videos.
4. Add a cascading style sheet for designing the web page.
5. Use user defined function to get array of values and sort them in ascending order on web page
6. Design a dynamic web page with validation of form field using JavaScript.
7. Design a simple Login form.
8. Event Handling Validation of registration form.
9. Open a Window from the current window on Mouse Over event.
10. Create a simple application to demonstrate the use of get and post methods.
11. Demonstrate Array Objects and Date Object's predefined methods
12. Display calendar for the month and year selected from combo box
13. Create a welcome Cookie (Hit for a page) and display different image and text content eachtime when the user hit the page
14. Demonstrate Request and Response object using Java Script in HTML Form.

15. Design a page to display all the values in the HTML table from XML File.

Note: The actual experiments/assignments will be designed by the course coordinator. One assignment should be designed to be done in groups of two or three students. The assignments must meet the objective of the course and the levels of the given course outcomes. The list of assignments and schedule of submission will be prepared by the course coordinator at the beginning of the semester.

Semester II

DATA STRUCTURES AND ALGORITHMS

General Course Information

Course Code: DCA-21-T Course Credits: 3 Maximum Marks: 100 Mode: Lectures (L) Minimum Pass marks: 40 Examination Duration: 3 hours	**Course Assessment Methods (internal: 30; external: 70)** **Note:** Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks.

Pre-requisites: Elementary Programming skills in C, C++ etc.

About the Course

Data Structure and Algorithms is a core and an essential course for every graduate in Computer Science and Engineering. This course introduces data structures like arrays, linked lists, trees and graphs etc. and various operations to be implemented on these data structures for solving real world problems. It includes various sorting and searching algorithms as well. Further, it incorporates complexity analysis of algorithms implemented on various data structures.

Course Outcomes: By the end of the course students will be able to:

CO1. **Define** various types of data structures and operations that can be implemented on thesedata structures.
CO2. **Demonstrate** the use of various data structures and their related operations.
CO3. **Apply** data structure to solve computational problems.
CO4. **Compare** the suitability of alternative data structures and prescribed operations forvarious problem situations.
CO5. **Defend** solutions with respect to effective storage of data and efficiency of the required operations for solving real world problems.

COURSE CONTENTS

Unit - 1

Introduction to data structures and their types, Abstract data types, Linear lists: Arrays and linked lists: memory representations, implementing operations like traversing, searching, inserting and deleting etc. Applications of arrays and linked lists.

Unit - 2

Stack and Queue: Static and linked implementations, Operations and Applications. Type of queues. Trees, Binary trees and related terminology, Tree traversals (Recursive), Threaded Binary Trees, Binary Search Trees implementation and operations.

Unit - 3

Graph definitions and related terminology, memory representations and related operations (traversal, insertion, deletion, search), Path Matrix, Warshall's Shortest path algorithm Hashing, Hash tables, hash function and collision resolution.

Unit - 4

Sequential and binary search, Sorting algorithms: Bubble sort, Selection sort, Insertion sort, Quick sort, Merge sort, Heap sort, Time and space complexity of algorithms: Asymptotic analysis, Big O, Omega, Theta notations.

Text and Reference Books:

1. Aho, A. V., Ullman, J. D., and Hopcroft, J. E., *Data Structures and Algorithms*, Addison-Wesley, 1983.
2. LangsamYedidyah, Augenstein J Moshe, Tenenbaum M Aaron, *Data Structures using C and C++*, 3rdedition, PHI, 2009.
3. Cormen, T. H., Leiserson, C. E., Rivest, R. L. and Stein, C., *Introduction to Algorithms*, MIT Press, 2009.
4. Robert L. Kruse, *Data Structure and Program Design in C*, Pearson Education India, 2007.
5. Weiss, M. A., *Data Structures and Algorithm Analysis in C++*, Addison-Wesley, 2007.
6. Sahni, S., *Data Structures, Algorithms, and Applications in C++*, WCB/McGraw-Hill, 2001.

DATA ANALYTICS

General Course Information

Course Code: DCA-22-T Course Credits: 3 Mode: Lectures (L) Maximum Marks: 100 Minimum Pass marks: 40 Examination Duration: 3 hours	**Course Assessment Methods (internal: 30; external:70)** **Note:** Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks

Pre-requisites: Basic programming skills, basic statistics.

About the Course

In this course, the learners will be able to develop expertise related to

1. Learn to load, clean/process, and transform the data
2. Learn to analyse and interpretation of the data using recent approaches
3. User of languages, algorithms as well as mathematical and statistical models.
4. Problem formulation and selection of appropriate models for data to solve the hidden solutions to business-related challenges.
5. Working with different types of method for data representation.
6. Incorporating data mining software to solve real-world problems.
7. Apply algorithms to build the machine more intelligence.

Course Outcomes: By the end of the course students will be able to:

CO1. **Define** the basic terms related to data science
CO2. **Describe** data with statistical summaries and plots
CO3. **Build** predictive models.
CO4. **Analyse** the quality of a model fit
CO5. **Interpret** and evaluate predictive models
CO6. **Conclude** the findings of predictive modelling.

COURSE CONTENTS

Unit - 1

Data science preliminaries: scales of measurements and their implementation. Working with vectors, matrices and tabular data (data frames), reading and writing tabular data from and to files.Working with excel files. statistical summaries. Quantile-Quantile plot. user-defined functions in R/Python.

Manipulating tabular data: Sorting, filtering cases, selecting and deriving new variables, grouping and summarizing data. working with packages (dplyr, tidyverse etc. packages in Python) for data manipulations and transformations

Unit - 2

Exploratory data analysis: random and normally distributed variables, skewed normal distribution, z-score, detecting outliers in data, handling missing values.

Visualizing data through various plots and charts: pie chart, bar charts, histogram, frequency polygon, density plots, scatter plots, box, heat maps, plotting the above graphs in R/Python, plotting

with package- ggplot2 in R or any equivalent package in Python.

Unit - 3

Predictive modeling: what is predictive modeling, estimating a function, the trade-off between model accuracy and prediction accuracy and model interpretability, regression versus classification, measuring the quality of fit, The bias and variance trade- off. Linear regression modeling to estimating the coefficients, assessing the accuracy of the coefficient estimates.

Unit - 4

Classification Modeling: The process of classification, decision tree, bayesian, k-NN, SVM classification models and their implementation in R/Python. evaluating a classification model: confusion matrix, accuracy, sensitivity, specificity, f-measure, kappa statistics,ROC and area under curve.

Evaluating the accuracy of a classifier: holdout or random sampling methods, cross-validation, bootstrap methods.

Text and Reference Books:

1. Han, J., Kamber, M, Pei, J., Data Mining Concepts and Techniques, Third edition, Morgan Kaufmann, 2012.
2. W. N. Venables, D. M. Smith and the R core Team, An introduction to R, Notes on R: A Programming Environment for Data Analysis and Graphics, version 3.3.2, 2016.
3. Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani, An Introduction to Statistical Learning with Applications in R, Springer, 2013.
4. Hadley Wickham and Garrett Grolemund, R for Data Science Import, Tidy, Transform and model Data, O'Reilly, 2017.
5. Roger D. Peng, R Programming for Data Science, Lean Publishing, 2015.
6. Beazley, D., & Jones, B. K. Python Cookbook: Recipes for Mastering Python 3. O'Reilly Media, 2013.
7. Muller, A. C., & Guido, S. Introduction to Machine Learning with Python: A Guide for Data Scientists. O'Reilly 2016.

DATABASE MANAGEMENT SYSTEM

General Course Information

Course Code: DCA-23-T Maximum Marks: 100 Course Credits: 3 Mode: Lectures (L) Minimum Pass marks: 40 Exam Duration: 3 hours	**Course Assessment Methods (internal: 30; external: 70)** **Note:** Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks.

Prerequisite: Knowledge of windows, a programming language and data structures.

About the Course:
This course includes a detailed coverage of principles of database design and models. Students learn querying a database using SQL, normalization techniques, transaction processing etc.

Course Outcomes: By the end of the course students will be able to:
CO1. **Describe** fundamental elements of Database Management System.
CO2. **Discuss** principles of relational Database modelling.
CO3. **Apply** SQL for designing queries for Relational Databases.
CO4. **Contrast** various concurrency control and recovery techniques with concurrent transactions in DBMS.
CO5. **Design** models of databases using ER modelling and normalization for real life applications.

COURSE CONTENTS

UNIT- I

Overview: Overview of File Systems and Database Systems, Characteristics of the Data Base Approach, Database users, Advantages and Disadvantages of a DBMS, Responsibility of Database Administrator.
Data Base Systems Concepts and Architecture and various views of Data, Data Independence, Database languages, Data Models: Relational Database Model, Hierarchical Data Model, Network Data Model, Schemas and Instances.

UNIT- II

E-R Model: Entity Types, Attributes & Keys, Relationships, Roles and Structural Constraints, E-R Diagrams, Reduction of an E-R Diagram to Tables. Relational Model and Query Language: Overview of Relational Database, Key Integrity Constraints, Relational Algebra, Relational Calculus, SQL fundamentals, Basic Operators, Missing information and NULL values, Advanced SQL features

UNIT- III

Relational Database Design: Overview of normalization, Database Anomalies, Candidate and Super Key, Functional Dependencies, Integrity Constraints, Decomposition, Normal forms: First, Second, Third Normal, Boyce Codd, Normal Form, Multi-valued Functional Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form, Denormalization.

UNIT- IV

Concurrency Control Techniques: Overview of database Transactions, Transaction states, ACID properties of a Transaction, Transaction Recovery, Concurrency Control, Locking Techniques, Time-stamp ordering, Multi-versionTechniques, Deadlock, Recovery Techniques in centralized DBMS.

Text and Reference Books:

1. Elmasri, R., and Navathe, S. B., Fundamentals of Database Systems, 3rd Edition, Addison Wesley, 2002.
2. Silberschatz, A., Korth, H. F., and Sudarshan, S., Database System Concepts, McGraw Hill, 2011.
3. Pannerselvam R., Database Management Systems, 2nd Edition, PHI Learning, 2011.
4. Desai, B. C., An Introduction to Database System, Galgotia Publication, 2010.
5. Leon, A., and Leon, M., Database Management Systems, Ist Edition, Vikas Publishing, 2009.
6. Mata-Toledo, R., Cushman, P., Sahoo, D., Database Management Systems, Schaums' Outline series, TMH,2007.

PYTHON PROGRAMMING

General Course Information

Course Code: DCA- 24-T Course Credits: 3 Mode: Lectures (L) Maximum Marks: 100 Minimum Pass marks: 40 Examination Duration: 3 hours	**Course Assessment Methods (internal: 30; external: 70)** Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks

Pre-requisites: The fundamentals of Data Structure.

About the Course: Python is a popular open source programming language used for both standalone programs and scripting applications in a wide variety of domains. It is free, portable, and powerful and is bothrelatively easy and remarkably fun to use. In today's era Python has found great applicability in machine learning, data analytics and many other data science applications. This is introductory course and covers most of the basic concepts required for basic python programming. Some of the contents are advanced may be useful for data analytics purpose

Course Outcomes: By the end of the course students will be able to:

CO1. **Describe** the basic terminology related to theory of computation.
CO2. **Understand** the concepts of basic machines like FA, NFA, Moore, Mealy etc.
CO3. **Construct** automata for any given pattern and find its equivalent regular expressions.CO4. **Analyze** different types of grammar.
CO5. **Design** various types of machines for given grammar.

COURSE CONTENTS

Unit - I

Introduction to Python, History of Python, Features of Python, Python Identifiers, Python Character Set, Keywords and Indentation, Comments, Command Line Arguments, Assignment Operator, Operators and Expressions, print() Function, input() Function, eval() Function, Python Data Types: int, float, complex, Variables, Mutable vs Immutable variables, Namespaces, Decision Statements: Boolean Type, Boolean Operators, if statement, else statement, Nested Conditionals Statements, Multi-way Decision Statements (else if statement).

Unit - II

Loop Control Statements: While loop, range() Function, For Loop, Nested Loops, Infinite Loop, Break Statement, Continue Statement, Pass Statement, Introduction to Strings, String Operations: Indexing and Slicing, Lists: Slicing, In-built Functions for Lists, List Processing: Searching and Sorting, Dictionaries, Operations on Directories, Deletion; Tuples, operations on Tuples, Inbuilt Functions for Tuples, Introduction to Sets, operations onsets.

Unit - III

Python Functions, Inbuilt functions, Main function, User Defined functions, Defining and Calling Function, Parameter Passing, Actual and Formal Parameters, Global and Local Variables, Recursion,

Passing Functions as Data, Lamda Function, Modules, Creating and importing own Module, Packages.
Operations on File: Reading text files, read functions, read (), readline() and readlines(), writing Text Files, write functions, write() and writelines(),Manipulating file pointer using seek, Appending to Files, Python Object Oriented concepts

Unit - IV

Databases in Python: Create Database Connection, create, insert, read, update and delete Operation, DML and DDL Operation with Databases.
Python for Data Analysis: numpy: Creating arrays, using arrays and Scalars, Indexing Arrays,Array Transposition, Pandas: Series, Data Frame, Panel, Index objects, Re-indexing, Iteration, Sorting. Matplotlib Visualization package, Sklearn: loading of dataset, learning and predicting, Model Persistence.

Text and Reference Books:

1. Ashok Namdev Kamthane, Programming and Problem Solving with Python, McGraw Hill Education Publication, 2018.
2. John Guttag, Introduction to Computation and Programming using Python, Springer,Revised and Expanded version (Referred by MIT), 2013.
3. Lutz, M., Learning Python: Powerful Object-Oriented Programming. O'Reilly Media, Inc.,2013.
4. Michael T Goodrich and Robertto. Thamassia, Micheal S Goldwasser, Data Structures and Algorithms in Python, Wiley, 2016.
5. Y. Daniel Liang, Introduction to Programming Using Python, Pearson, 2013.
6. Reema Thareja, Python Programming Using Problem Solving Approach, Oxford Publications, 2017.
7. Dr. R. Nageswara Rao, Allen B. Downey, Core Python Programming, Think Python, O'Reilly Media, 2012.
8. Kenneth A. Lambert, The Fundamentals of Python: First Programs, Cengage Learning, 2011.

COMMUNICATION SKILLS AND PERSONALITY DEVELOPMENT

General Course Information

Course Code: DCA-25-T **Course Credits**: 3 **Mode: Lectures (L)** **Maximum Marks:** 100 **Minimum Pass marks**: 40 **Examination Duration:** 3 hours	**Course Assessment Methods (internal: 30; external: 70)** **Note:** Examiner will be required to set nine questions in all. First question will be compulsory, consisting of objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory question number one. All questions will carry equal marks.

Pre-requisites: Students have basic knowledge of Communication skills and Personality development.

About the Course

This course is to help students become familiar with the fundamental conceptsof Communication skills, body language and Personality development. They will be preparing for job interviews.

Course Outcomes: By the end of the course students will be able to:

CO1. **List** Student able to list his/her various abilities strength and weak point.
CO2. **Explain** Student able to explain his/her idea to others.
CO3. **Apply** Students learn to apply best use of his skill and personality.
CO4. **Analyze** Student observe and analyze the others very confidentially.
CO5. **Design** Students design the solution for real time problems.

COURSE CONTENTS

UNIT-I

Personality: Definition, Elements, Determinants.
Personal Grooming: Personal Hygiene, Social Effectiveness, Business Etiquettes (PowerDressing).

UNIT-II

Body Language: Non-Verbal Communication, Types of Body Language, Functions of Body Language, Role of Body Language, Proxemics.
Art of Good Communication: Verbal & Non-Verbal Communication, Difference between Oral and Written Communication, 7' Cs of Effective Communication, Importance of Effective Communication.

UNIT-III

Team: Team Behaviour, Types of Teams, Team Roles and Behaviour.Group Discussion: Do's and Don't.

UNIT-IV

Interview Preparation: Introduction, Resume Writing, Dress Code, Mock- Interview, how to be successful in an Interview.

Text and Reference Books:

1. C. S. Venkata Ratanam and B. K. Srivastava, "Personal management and HumanResources", Tata McGraw Hill Publishing Ltd. New Delhi. 1991
2. Keith Davis, "Human Behaviour at Work", Tata McGraw Hill Publishing Ltd. New Delhi. 1972
3. Thomas A. Harris, "I'm OK, You're OK", Pan Books, London and Sydney. 1973
4. Ranjana Salgaocar, "Pleasure of your Company", Pyramid Publishers, Goa. 1995
5. Arun Agarwal, "How to get the job you want", Vision Books, New Delhi. 1997
6. Rohit Anand and Sanjeev Bikhachandani, "Get That Job", Harper Collins. 1996

Database Management System Lab

General Course Information

Course Code: DCA-26-P Course Credits: 2 Mode: Lab practice and assignments Maximum Marks: 100 Minimum Pass marks: 40	**Course Assessment Methods (internal: 30; external: 70)** **Note:** The actual experiments/assignments will be designed by the course coordinator. Oneassignment should be designed to be done in groups of two or three students. The assignments must meet the objective of the course and the levels of the given course outcomes. The list of assignmentsand schedule of submission will be prepared by the course coordinator at the beginning of the semester.

About the Course: This lab. course on DBMS involves a rigorous training on Oracle programming. It provides a strong formal foundation in database concepts, technology and practice to the students to groom them into well-informed database application developers. The objective of the lab course is to develop proficiency in the execution of commands of the database design and query using Oracle.

Course Outcomes: By the end of the course students will be able to:

CO1. **Implement** database problems using DML/DDL commands.
CO2. **Enforce integrity** constraints on a database using a state-of-the-art RDBMS.
CO3. **Analyse** the design of a relational database.
CO4. **Plan** a relational database for a given schema.
CO5. **Create** lab assignment record that includes problem definitions, solutions, results and conclusions.
CO6. **Demonstrate** ethical practices, self-learning and team spirit.

List of experiments/assignments:

1. Use oracle software and login with valid userid and password. Explore its GUI and practice some basic commands of it.
2. Three assignments related to creation of database with tables having different fields and data types.
3. Two assignments on the creation of table with different types of constraints.
4. Two assignments on insert, delete and modify records from the tables.
5. Two assignments on modifying the table using the alter command.
6. Two assignments on exploring select statement using various clauses like where, order by, group by, having and aggregate functions.
7. Two assignments on the use of set operations to query the tables.
8. Two assignments on creating joins and views on the tables.
9. One assignment on generating sub-queries.

Note: The actual experiments/assignments will be designed by the course coordinator. One assignment should be designed to be done in groups of two or three students. The assignments must meet the objective of the course and the levels of the given course outcomes. The list of assignments and schedule of submission will be prepared by the course coordinator at the beginning of the semester.

Python Programming Lab

General Course Information

Course Code: DCA-27-P Course Credits: 2 Mode: Lab practice and assignments Maximum Marks: 100 Minimum Pass marks: 40	**Course Assessment Methods (internal: 30;external: 70)** The internal and external assessment is based on the level of participation in lab. sessions and the timely submission of lab experiments/assignments, the quality of solutions designed for the assignments, theperformance in VIVA-VOCE, the quality of lab. File and ethical practices followed. The internal examination is conducted by the course coordinator. The external examination is conducted by external examiner appointed by the Controller of Examination in association with the internal examiner appointed by the Chairperson of the Department.

Pre-requisites: Basics Programming skills e.g. C, C++.

About the Course:

Python is a scripting programming language known for both its simplicity and wide breadth of applications. For this reason, it is considered one of the best languages for beginners. Used for everything from web development to scientific computing Python is referred to as a general-purpose language by the greater programming community. The major objective of Python language is to make the students solve real word problem efficiently using python library.

Course Outcomes:

By the end of the course students will be able to:

CO1. **Implement** solutions to the given assignments in Python.
CO2. **Use** various Python packages for solving different programming problems.
CO3. **Devise** solutions for complex problems of data analysis and machine learning.
CO4. **Evaluate** the output of data analysis and machine learning models.
CO5. **Create** lab records of the solutions for the given assignments.
CO6. **Demonstrate** use of ethical practices, self-learning and team spirit.

List of experiments/assignments

1. Install Python and explore various popular IDE like IDLE, PyCharm, and Anaconda.
2. Assignments to perform various number operations like
   a) Find maximum from a list of numbers
   b) GCD of two number
   c) Square root of a number
   d) Check number is prime or not.
   e) Print first N prime numbers
   f) Remove duplicate numbers from list
   g) Print the Fibonacci series.
3. Assignments to perform various operations on Strings like creation, deletion,concatenation.
4. Create a List L = [10, 20, 30]. Write programs to perform following operations:
   a) Insert new numbers to listL
   b) Delete numbers from listL.
   c) Sum all numbers in list L.

d) Sum all prime numbers in listL.
e) Delete the listL.

5. Create a Dictionary D= {'Name': 'Allen', 'Age': 27, 5:123456}.
   Write programs to perform following operations:
   a) Insert new entry inD.
   b) Delete an entry fromD.
   c) Check whether a key present in D.
   d) Update the value of akey.
   e) Clear dictionaryD.
6. Two assignments on Sets to perform various operation like union, intersection, difference etc.
7. Two assignments related to searching operation like linear search, binary search.
8. Three assignments related to sorting like selection sort, bubble sort, insertion sort.
9. Demonstrate the use of dictionary for measuring student marks in five subjects and you have to find the student having maximum and minimum average marks.
10. Two assignment on usage of different available packages like random package to perform
    a) Print N random numbers ranging from 100 to500.
    b) Print 10 random strings whose length between 3 and5.
11. Two assignments on usage of package such as Numpy, Pandas.

Note: The actual experiments/assignments will be designed by the course coordinator. One assignment should be designed to be done in groups of two or three students. The assignments must meet the objective of the course and the levels of the given course outcomes. The list of assignments and schedule of submission will be prepared by the course coordinator at the beginning of the semester.

DCA-28 MAJOR PROJECT

General Course Information

Course Code: DCA-28 Course Credits: 6 Mode: Self learning under the guidance of a faculty member.	**Course Assessment Methods (internal: 30; external: 70)** Evaluation is done by the internal examiner (project guide) and external examiner appointed by Controller of Examination. The criteria for evaluation are given below. 1. Review of literature related to problem domain: 15 2. Significance and originality of the solution presented: 15 3. Application of software engineering principles and project management: 15 4. Significance and Scope of results: 20 5. Organization and presentation of major project report: 20 6. Level of Ethics and societal issues covered: 15

About the Project Work:

Students start working on their project work in the beginning of second semester. Students do the background research for identifying appropriate problems, methodology and tools for their respective project works. They prepare a synopsis of the project work to be carried out. Each student is required to prepare a synopsis in the format provided and present it in front of a committee constituted by the Director/Chairperson of the Department. Students can carry out projects in groups of two. In case of group project,the size of the problem should be significant, and members of the group must specify their individual contribution.

After approval by the internal committee, they continue working on their project work throughout 2nd semester. They carry out implementation of their respective projects based on the problem identified, methodology and tools suggested in the approved synopsis. They are required to complete their project work by the end of 2nd semester. They prepare the final project reports according to the format provided. Atthe end of second semester, each student is required to present his/her project work in front of internal projectguide and external examiner appointed by Controller of Examination.

Course Outcomes: After doing Project students will be able to:

CO1. **Evaluate** critically the existing solutions and methodologies through reviewing literature.
CO2. **Plan** the project according to principles of project management.
CO3. **Devise** original solutions to complex problems using modern tools.
CO4. **Justify** the outcomes of the project work.
CO5. **Organize** and communicate (written and oral) ideas effectively.
CO6. **Develop** solutions that meet ethical, societal and legal considerations.

Department of Computer Science and Engineering
Guru Jambheshwar University of Science and Technology, Hisar-125001

Name of the Programme: Semester: Session:	Credits: 6 Total Marks: 100

Evaluation of Project Work (DCA-28)

SR. No.	Roll.No.	Review of literature related to problem domain CO1(15)	Application of principles of software engineering and project management CO2(15)	Significance and originality of the solutionpresented CO3(15)	Significance and Scope of the Results CO4(20)	Organisation and presentation of majorproject report CO5(20)	Level of Ethics followed and societalissues covered CO6(15)
1							
2							
3							

Name of the external examiner: Signature of the External Examiner: Date:	Name of the internal examiner: Signature of the internal Examiner: Date:	Total Candidates: No. of Candidates Present: No. of Candidates Absent:

Guidelines for preparing Project Work (Synopsis)

All the students are required to follow these guidelines for preparing their project synopsis.

General Guidelines

1. The student should follow ethical practices while doing the synopsis work. Any violation of ethical practices will lead to rejection of the synopsis. For instance, a plagiarized synopsis or areadymade synopsis purchased from market will be rejected straight away.
2. The synopsis must be submitted to the internal guide in soft binding at least 7 days before the presentation so that he/she can suggest changes.
3. Synopsis carried out in groups of two students must include the division of work.

Formatting Instructions

The formatting instructions are given in Table below.

Formatting Instructions		
Sr. No.	**Item**	**Formatting**
1.	No. of pages	Minimum 6 and maximum 10
2.	Paper size	A4
3.	Font Type	Times New Roman
4.	Normal text size	12
5.	Page numbering	Place: Centre Bottom
6.	Margins	Left margin: 3.75 cms (1.5 inch) Right, bottom, top= 2.5 cms (1 inch)
7.	References/Bibliography	IEEE format
8.	Binding	Soft binding of good quality

Contents of the Project Work (Synopsis)

The synopsis must be written in English. The ideas must be organized in a clear and concise fashion. Sections must be tentatively organized as below.

1. Contents Page
2. Introduction
3. Background Details and Literature Review
4. Problem Formulation and Objectives
5. Methodology and tools to be used
6. References/Bibliography

Signature
Name of Student
Registration Number
Department of Computer Science and Engineering
Directorate of Distance Education
Guru Jambheshwar University of Science andTechnology, Hisar

Signature
Supervisor
Designation
Department of Computer Science and Engineering
Directorate of Distance Education
Guru Jambheshwar University of Science andTechnology, Hisar

TITLE OF THE PROJECT WORK

(Write in Times New Roman, 16-point size, Bold and Centred and Uppercase font)

Project Work submitted to

Guru Jambheshwar University of Science and Technology, Hisar for the partial award of the Diploma

(Write inTimes New Roman, 12-point size font, Bold, Italics and Centred style after 4lines gap with 12 font size from the title of the project)

of

(Write in Times New Roman, 12-point size font, Bold, Italics and Centred style after2 lines gap with 12 fontsize from the text above in three lines)

Diploma in Computer Application

(Write in Times New Roman, 14-point size, Bold, Centredstyle after "***of***" after 2 linesgap with 12 font size)

by

(Write in Times New Roman 12-point size, Bold, Italics, and Centredstyle after thename of the degree with 2 lines gap with 12 font size)

Your Name
(Enrolment Number)

Supervisor Name
Designation

(Write in Times New Roman, 14-point size font, Bold, Centred style after 2 lines gapwith 12 font from "***by***")

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
DIRECTORATE OF DISTANCE EDUCATION
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR

Month, Year

(Write in Times New Roman, 14-point size font, Bold, Centre dstyle, after 2 lines gapfrom logo)

Guidelines for preparing Project Work Report

All the students are required to follow these guidelines for preparing their final project report.

General Guidelines:

1. The title of the project must be same as that of the title in the synopsis submitted.
2. The report must include a declaration by the student that he/she has followed ethical practices while doing the project work. Any violation of ethical practices will lead to rejection of the report. For instance, a plagiarized report or a readymade report purchased from market will be rejected straight away.
3. Project works carried out in groups of two students must include the individual contribution ofthe students.
4. A CD of the project work should be included in closed pocket inside the back cover page. TheCD must bear the name, registration number and title of the project.
5. The report must be submitted to the internal guide in soft binding at least 10 days before the final examination so that he/she can suggest changes before the report is presented to external examiner.

Formatting Instructions

The formatting instructions are given in Table below.

Formatting Instructions

Sr. No.	Item	Formatting
1.	Front Cover	Dark Green and contents in golden ink
2.	No. of pages	Minimum 40 and maximum 70 excluding front material
3.	Paper size	A4
4.	Font Type	Times New Roman
5.	Chapter Heading Font	16
6.	Font of Sections and Subsections	14 and 12 in bold style
7.	Numbering style for sections and subsections; Do not use more than three levels.	2., 2.1 and 2.1.1
8.	Normal text size	12
9.	Figures and Tables must be numbered chapter-wise. Table headings on the top of the tables and Figure heading at the bottoms of the figures.	For example for chapter 2, Figures should be numbered as Fig. 2.1, Fig. 2.2 etc. and Tables as Table 2.1 and Table 2,2 etc.
10.	Page numbering	Place: Centre Bottom Type: Front material in Roman numbers Body of the report: in Arabic numerals. Pagination must start with first page of the first chapter and continue throughout the end of the report.
11.	Margins	Left margin: 3.75 cms (1.5 inch) Right, bottom, top= 2.5 cms (1 inch)
12	References/Bibliography	IEEE format
13	Binding	Hard binding of good quality

Contents of the Project Report

The contents of the report should be organised as described below.

1. The first page in the report should be same as the cover page.
2. Declaration that the students has carried out his work on his own. It is his/her original creation,not plagiarised from any other source and due credit has been given to the source material usedin the report through references and citations.
3. Acknowledgement
4. List of figures
5. List of Tables
6. List of Abbreviations
7. Contents
   Abstract (in not more than 250 words)
   This answers the question what have you done? How have you done and brief indication aboutthe results.
8. Body of the Report
   The report must be written in English. The ideas must be organised in a clear and concisefashion. Chapters must be tentatively organised as below.

   Chapter 1. Introduction
   This includes introduction to relevant area of project, problem formulation objectivesof the project, and structure of the project report.
   Chapter 2. Background Details and Literature Review
   Chapter 3. Design or Framework of the project work Methodology, Data Flow Diagrams, Entity Modelling etc.
   Chapter 4. Discussion and Analysis of Results Discussion and comparison of results.
   Chapter 5. Conclusion and Future Scope
   This includes relevance and scope of the project work, and its extensions.
   References/Bibliography

9. Appendices

Declaration to be Submitted

The format of declaration to be included in the project report is given on next page.

Format of the Title Page

The format of the title page for the Project Work is given on the next to next page

DECLARATION

I, *Your Name*, *Your Roll No.*, certify that the work contained in this project report is original and has been carried by me under the guidance of my supervisor. This work has not been submitted to any other institute for the award of any degree or diploma and I have followed the ethical practices and other guidelines provided by the Department of Computer Science and Engineering in preparing the report. Whenever I have used materials (data, theoretical analysis, figures, and text) from other sources, I have given due credit to them by citing them in the text of the report and giving their details in the references. Further, I have taken permission from the copyright owners of the sources, whenever necessary.

Signature
Name of Student
Registration Number
Department of Computer Science and Engineering
Directorate of Distance Education
Guru Jambheshwar University of Science and Technology, Hisar

Signature
Supervisor
Designation
Department of Computer Science and Engineering
Directorate of Distance Education
Guru Jambheshwar University of Science and Technology, Hisar