Detailed Syllabus
Lecture-wise Breakup

Course Code **NBA Code**	**23B61CA121** **CBAC108**	**Semester II (EVEN)** **(specify Odd/Even)**	**Session 2024-25** **Month from** January to July
Course Name	Data Structures		
Credits	3-1-0	**Contact Hours**	4

Faculty (Names)	**Coordinator(s)**	Ms Jyoti
	Teacher(s) (Alphabetically)	Dr. Ruchin Gupta, Ms Jyoti

COURSE OUTCOMES		**COGNITIVE LEVELS**
CBAC108.1	Explain the basics of data structures, their need and types viz. linear and non-linear, abstract data types.	Understand Level (Level 2)
CBAC108.2	Build various linear data structures and their related operations to address diverse problems and applications.	Apply Level (Level 3)
CBAC108.3	Develop various non-linear data structures and demonstrate operations like search, traverse, insertion, deletion, etc.,	Apply Level (Level 3)
CBAC108.4	Examine appropriate data structures to solve a given problem and develop an effective approach for the specified problems.	Analyze Level (Level 4)
CBAC108.5	Appraise the most suitable data structures for solving real-world problems.	Evaluate Level (Level 5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction	Fundamentals of Linear and Non-Linear Data Structures, need of data structures, Memory Allocation – Static and dynamic, Introduction to Abstract Data Types.	4
2.	Linear Data Structures with Abstract	Review of Arrays: One dimension, two-dimension, memory representation, address calculation, and related operations. Stack: Static and dynamic implementation, operations, applications like conversion between polish and reverse	8

	Data Types	polish notations. Queue: Static and dynamic implementation, operations, types: linear, circular, doubly ended.	
3.	Linked List Fundamentals	Linked List: Singly, Doubly, Circular, and related operations like Creation, Insertion, Deletion, Modification, Searching, Sorting, Reversing, and Merging.	10
4.	Searching and Sorting	Searching – Review of Linear Search and Binary Search. Hashing – Hash Table, Chaining, Probing. Sorting – Merge, Quick, Radix, Bucket, and Count. Review of insertion, selection, bubble sort.	8
5.	Non-Linear Data Structures	Trees: Notations & Terminologies, Memory Representation, Binary Trees Types- Complete, Full, Strict. Tree Traversals (Recursive and non-recursive), Binary Search Tree and Basic Operations, Threaded Binary Tree. Balanced BST: AVL Tree, Introduction to B Tree. Priority Queue using Binary Heaps. Graphs: Notations and Terminologies, Memory Representation: Adjacency Matrix and List; Graph Traversal using DFS and BFS.	12
		Total number of Lectures	**42**

Evaluation Criteria		
Components	**Maximum Marks**	
T1	20	
T2	20	
End Semester Examination	35	
TA	25	
(Mini Project (10), Attendance (5), Assignment/Quiz/Programming Contest (10))		
Total	**100**	

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

Text Book:

1	Dinesh P. Mehta and Sartaj Sahni, Handbook of Data Structures and Applications, 2nd Ed., Chapman and Hall/CRC Computer and Information Science Series, CRC Press
2	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, Introduction to rithms, MIT Press, 3rd Edition, 2009
3	Seymour Lipschutz, Data Structures with C, Schaum's Outline Series, McGraw Hill, 2010

4	Y. Langsam, M. J. Augenstein and A.M. Tanenebaum, “Data Structures using C and C++”, Pearson Education India, Second Edition, 2015.
	Reference Book
1	Alfred V. Aho, J.E. Hopcroft, Jeffrey D. Ullman, Data Structures and rithms, Addison-Wesley Series in Computer Science and Information Processing, 1983
2	Y. Kanetkar “ Data Structures through C”, BPB Publication, Third Edition, 2019.
3	R.F Gilberg, and B A Frouzan- “Data Structures: A Pseudocode Approach with C”, Thomson Learning, Second Edition, 2004.
4	E. Horowitz and S. Sahni, “Fundamentals of Data Structures in C”. Universities Press, Second edition, 2008.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	1	1	1	1			1		1
	Analysis of problems to explain the need of different types of data structures	Analyse real time problems to suggest relevant Data structures	Understand to compare different solutions for a single problem in hand	Explore different offline/online tools available for implementing solutions			Understand the need for learning DS in real life		Understand the role of DS at software level to be embedded as appropriate solution for hardware to work
CO2	2	2	1	1			2		1
	Fundamentals of stack, queue, linked list	Analyse solution using stack, queue and lists	Using Linear DS design solution efficient than brute force	Use different offline/online tools available for implementing solutions using Linear DS			Apply linear DS and map them to different real-life scenarios to understand their impact on betterment of life		Develop solutions using Linear DS at software level to be embedded as appropriate solution for hardware to work
CO3	2	2	1	1			2		1
	Fundamentals of Multi list, tree and graphs	Analyse solution using Multi list, tree and graphs	Using Non-Linear DS design solution efficient than brute force	Use different offline/online tools available for implementing solutions using Non-Linear DS			Apply Non-Linear DS and map them to different real-life scenarios to understand their impact on betterment of life		Develop solutions using Non-Linear DS at software level to be embedded as appropriate solution for hardware to work
CO	2	2	1	1	2	1	3		1

4	Mapping appropriate DS according to problem in hand	Identify which DS is suitable for the problem	Apply DS w.r.t. which a solution can be developed for a problem	Use different offline/online tools available for implementing solutions using various Data structures	Engineer solution to real time problems using appropriate DS/ that's of societal usage	PBL component to apply all learned DS to learn project management and team work	Develop solution to real life applications using combination of different DS		Develop solutions using various DS at software level to be embedded as appropriate solution for hardware to work
CO 5	3	3	2	1	3	1	3		1
	Assess different approaches on a single problem	Analyse at DS level using pseudo time/space calculation	Choose best DS w.r.t. which most efficient solution can be proposed	Use different offline/online tools available for implementing and analysing solutions using various Data structures	Engineer effective solution to real time problems using appropriate DS/ that's of societal usage	PBL component to develop the most efficient solution using all learned DS to learn project management and team work	Develop and analyse solution to real life applications using combination of different DS		Assess solutions using various DS at software level to be embedded as appropriate solution for hardware to work

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	1	1	1	1			1		1
CO2	2	2	1	1			2		1
CO3	2	2	1	1			2		1
CO4	2	2	1	1	2	1	3		1
CO5	3	3	2	1	3	1	3		1
AVG	**2**	**2**	**1.2**	**1**	**1**	**0.2**	**2.1**	-	**1**

Detailed Syllabus
Lecture-wise Breakup

Course Code	**23B61CS122**	**Semester: EVEN**	**Semester: II Session: 2024-25** **Month from Jan 2025 to July 2025**
Course Name	**Database Management Systems**		
Credits	**3-1-0**	**Contact Hours**	**4**

Faculty (Names)	**Coordinator(s)**	**Pratik Shrivastava**
	Teacher(s) (Alphabetically)	**Pratik Shrivastava, Neetu Singh**

COURSE OUTCOMES		**COGNITIVE LEVELS**
CBAC109.1	Define basic database concepts in the design of application software.	Remember (Level 1)
CBAC109.2	Identify the data models for relevant problems and explain the basics of relational model.	Understand (Level 2)
CBAC109.3	Implement logical database design principles like modeling and normalization, and use SQL commands for efficient query processing.	Apply (Level 3)
CBAC109.4	Examine the usage of the concept of a database transaction and related database facilities, including concurrency control, storage and indexing, backup and recovery, and locking protocols.	Analyze (Level 4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Databases	Overview of data, database, database management system, DBMS Architecture, Data Independence, Three Schema architecture, File system vs DBMS, Data models, Schema, Instances, Database states, Role of database, administrator, Designers and end users.	5
2.	Structured Query Language	Overview, Characteristics, Advantage of SQL- DDL, DML, DCL, SQL data type, specifying constraints, Basic SQL queries. Logical operators: BETWEEN, IN, AND, OR, NOT, ANY, ALL. Set Comparison operators, Group by and Having Clauses, Nested queries, Joins, NoSQL.	7
3.	Procedural Language	PL/SQL: Data types, Stored Procedures, Functions, Exceptions, Cursors and triggers.	4

4.	Relational database And ER Model	Entity and its types, Entity set, Notations for ER Diagram, Attributes, Keys, Relationships and its types, Mapping Constraints, Enhanced ER Diagram, Specialization and generalization. ER to relational mapping: Steps to map ER diagram to relational schema	5
5.	Relational Model	Relational Data Models: Relational model terminology domains, Attributes, Tuples, Relations, characteristics of relations, relational constraints domain constraints, key constraints and constraints on null, Relational DB schema. Codd's Rules. Relational algebra: Basic operations selection and projection. Set Theoretic operations: Union, Intersection, set difference and division (Order, Relational calculus: Domain, Tuple, Well Formed Formula, specification, quantifiers). Join operations: Inner, Outer, Left outer, Right outer, and full outer join.	7
6.	Database Design	Functional Dependencies, Armstrong's inference rule, Normalization, First Normal form, Second Normal form, Third Normal Form, BCNF, Fourth Normal Form, Fifth Normal Form.	6
7.	Transaction and Concurrency Control	Definition of Transactions, ACID properties, Schedules, Serializability, Concurrency Control, Lock-based protocols, Time-stamp based protocols.	4
8.	Database Recovery	System Failure, Backup and recovery Technique, checkpoints, rollback, Deadlock, Storage and Indexing.	2
9.	Advance Database Model	NoSQL Database, Cloud Database, Graph Database, Document and Columnar Database	2
Total number of Lectures			**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25(Attendance:10, Assignments/Min-Project/Class Test/Quiz/Tutorial):15
Total	100

Project Based Learning: Each student in a group of 3-4 will choose a real-life application area. To make a project, the students will analyze and define the need of database systems in terms of functional requirements. Each group will design the Entity Relationship diagram to understand the organizational structure of the application area and implement the database in MySQL. Each group will identify 15-20 typical queries and execute them. For handling the multiple record, they will implement cursors ad triggers. Student will design the webpage of the application area and connect with the database.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Henry F Korth, Abraham Silberschatz, S. Sudurshan, Database system concepts, 6th Edition, McGraw-Hill,2010
2.	RamezElmasri, Shamkant B. Navathe, Fundamentals of Database Systems, 6th Edition, Pearson Education, 2011.
3.	Ramakrishnan, Gehrke, Database Management Systems, Mcgraw-Hill, 3rd Edition,Addison-Wesley,2006.
4.	Thomas Connolly, Carolyn Begg, Database Systems-A Practical Approach to design, Implementation and Management, 6th Edition, Pearson Education,2015.
5.	"An introduction to database systems" by Bipin C. Desai, West Publishing Company, College & School Division, 1990 - Computers - 820 pages
6.	Christopher J. Date, Database Design and Relational Theory: Normal Forms and All That Jazz, 2012.
7.	Rajiv Chopra, Database Management System (DBMS): A Practical Approach, 5th Edition, 2016, 682 pages.

CO-PO-PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	2	1	1					2	
	Understanding basic database concepts requires foundational knowledge in mathematics, logic, and engineering principles.	The ability to define database concepts enables students to analyze and solve complex engineering problems effectively.	Understanding database concepts is essential for designing solutions and system components that meet specified needs.					Database concepts are fundamental to computing and require knowledge of mathematics and engineering principles.	
CO2		2	2	2				2	
		Identifying data models and understanding the relational model involves analysis and application of principles from mathematics and engineering.	Understanding data models enables students to design solutions and system components effectively.	Explaining data models requires the synthesis of information and research-based knowledge.				Understanding data models and the relational model is a core aspect of computing and requires knowledge of relevant disciplines.	
CO3	2	2	2	2					1
	Demonstrating SQL commands and relational algebraic expressions requires a solid foundation in mathematics and logic.	Applying logical database design principles involves analyzing complex engineering problems and selecting appropriate methods.	Applying database design principles is crucial for designing effective solutions and system components.	Applying database modeling and normalization requires research-based knowledge and the synthesis of information.					Database modeling and normalization are essential in designing computer-based systems to meet specific needs effectively.
CO4	2	1			1				1
	Examining database transactions and related facilities requires understanding of fundamental principles in mathematics and engineering.	Analyzing database facilities involves reviewing research literature and selecting appropriate methods for analysis.			Examining database facilities involves applying appropriate techniques and tools to analyze complex engineering activities.				Understanding database facilities is crucial in designing and implementing computer-based systems effectively.

Avg.	**2**	**1.5**	**1.6**	**2**	**1**	**0**	**0**	**2**	**1**

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etailed Syllabus
Lecture-wise Breakup

Subject Code	**23B61CA123**	**Semester: Even**	**Semester: 2nd Session:** 2024-25 **Month:** Jan2025 to June 2025
Subject Name	Python 1		
Credits	**2-0-0**	**Contact Hours**	**2**

Faculty (Names)	**Coordinator(s)**	Shagun Gupta
	Teacher(s) (Alphabetically)	Alka Singhal, Shagun Gupta

COURSE OUTCOMES		**COGNITIVE LEVELS**
CBAC110.1	List and explain key reasons for Python's popularity and versatility as a scripting language.	Understanding (level 2)
CBAC110.2	Solve practical problems using variables, assignments, control structures, functions, and sequences.	Apply (level 3)
CBAC110.3	Utilize data structures for effective problem-solving in real-world contexts.	Apply (level 3)
CBAC110.4	Develop efficient Python scripts using array-oriented programming with NumPy and string-handling methods.	Apply (level 3)
CBAC110.5	Write Python scripts that address problems through file operations and exception handling techniques, also creating data visualization using Matplotlib.	Analyze (level 4)

Module No.	**Subtitle of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1	Introduction to Python	Language features Current applications of Python Reasons for increasing popularity Variables and assignment statements	2
2	Arithmetic Operators and Assignment statements	Operators (Arithmetic, Boolean, Relational) Augmented Assignments Function print and introduction to single and double quoted Strings Triple quoted strings Getting input from user Objects and dynamic typing	2

3	Control Statements	if, else, if…elseif, else statements while statement for statement, Nested for Loop Iterables, list and Iterators Built in range function Sequence controlled Iteration Formatted Strings Built in function range: A deeper look Using type Decimal for monetary amounts break and continue Statements	3

4	Sequences: Arrays, Lists and Tuples	Arrays and basic operations on Arrays Matrix Lists, Nested List Tuples Unpacking Sequences Sequence Slicing del Statement	2
5	Dictionaries and Sets	Introduction to Dictionaries Creating a Dictionary Iterating through a Dictionary Basic Dictionary Operations Dictionary Methods keys and values Dictionary Comparisons Dictionary Method update Dictionary Comprehensions Introduction to Sets Comparing Sets Mathematical Set Operations Mutable Set Operators and Methods Set Comprehensions	3
6	Functions	Defining functions Random Number Python Standard Library Math Module Functions Default Parameter Values Keyword Arguments Arbitrary Argument Lists Passing Lists to Functions Sorting Lists Searching Sequences Other List Methods Simulating Stacks with Lists List Comprehensions Generator Expressions Filter, Map and Reduce Other Sequence Processing Functions Two-Dimensional Lists Methods: Functions That Belong to Objects Scope Rules import: A Deeper Look Passing Arguments to Functions: A Deeper Look Recursion Functional-Style Programming	4
7	Array-Oriented Programming with NumPy	Creating arrays from Existing Data array Attributes Filling arrays with Specific Values Creating arrays from Ranges List vs. array Performance: Introducing %timeit array Operators NumPy Calculation Methods Universal Functions Indexing and Slicing Views: Shallow Copies Deep Copies	4

8	Strings: A Deeper Look	Formatting Strings Presentation Types Field Widths and Alignment Numeric Formatting String's format Method Concatenating and Repeating Strings Stripping Whitespace from Strings Changing Character Case Comparison Operators for Strings Searching for Substrings Replacing Substrings Splitting and Joining Strings Characters and Character-Testing Methods Raw Strings Replacing Substrings and Splitting Strings Other Search Functions; Accessing Matches	4

9	Files and Exceptions	Writing to a Text File: Introducing the with Statement Reading Data from a Text File Updating Text Files Serialization with JSON Additional Notes Regarding Files Handling Exceptions Division by Zero and Invalid Input try Statements Catching Multiple Exceptions in One except Clause What Exceptions Does a Function or Method Raise? What Code Should Be Placed in a try Suite? Finally, Clause Explicitly Raising an Exception Stack Unwinding and Tracebacks	4
10	Data Visualization	Introduction to matplotlib Data visualization Types of charts Steps for creating data visualization.	2
		Total number of Lectures	30

Evaluation Criteria

Components	**Maximum Marks**
Mid Term (T2)	30
End Semester Examination	40
TA	30 (Attendance (5), Assignment/ Mini Project/ Tutorial/ Quiz (25))
Total	**100**

Project based learning: Create a Python application either individually or in groups of maximum 4 students each, to illustrate the concepts covered in class.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

	Text Books
1	Paul Deitel and Harvey Deitel: *Python for Programmers*, 1st Edition, Deitel Developer Series, 2020.
2	Yashwant Kanetkar and Aditya Kanetkar: *Let us Python,* 6 th Edition, Worldwide Publishing, 2023
3	Allen Downey: *Think Python*, 2nd Edition, O'Reilly, 2015.
	Reference Books
1	Paul Barry: *Head First Python*, 3rd Edition, O'Reilly, 2023.

2	Erric Matthes: *Python Crash Course,* 3rd Edition, No Starch Press, 2023.

CO-PO and CO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO2
CO1	-	-	-	-	-	-	1	-	-
							Engage in life long learning on new areas where knowledge of Python can be applied	_	
CO2	3	2	2	1	-	-	1	-	1
	Strongly apply fundamental knowledge of variables, assignment statements, control statements, functions and sequences to provide solutions to problems using Python	Conduct a moderate level of analysis of problems and solve them using Python based variables, assignment statements, control statements, functions and sequences	Be able to create and demonstrate Python based applications using variables, assignment statements, control statements, functions and sequences that help resolve various needs of the society at moderate level	Slightly understand the constraints of variables, assignment statements, control statements, functions and sequences in developing applications using Python and apply them where appropriate			Able to engage in lifelong learning of new features introduced with respect to variables, assignment statements, control statements, functions and sequences in Python independently to a slight extent	-	Slightly acquire programming skills by learning usage of variables, assignment statements, control statements, functions and sequences in Python
CO3	2	2	2	1	-	-	1	-	1
	Apply knowledge of Dictionaries and Sets to provide solutions to problems using Python at moderate level	Solve application development use cases by applying the knowledge of Dictionaries and Sets at moderate level	Be able to create and demonstrate Python based applications using Dictionaries and Sets that help resolve various needs of the society at moderate level	Slightly understand the constraints of Dictionaries and Sets in developing applications using Python and apply them where appropriate			Able to engage in lifelong learning of new features introduced with respect to Dictionaries and Sets in Python independently to a slight extent	-	Slightly acquire programming skills by learning usage of Dictionaries and Sets in Python
CO4	2	2	2	1	-	-	1	-	1
	Apply knowledge of Array Oriented	Solve application development use cases by	Be able to create and demonstrate Python based	Slightly understand the constraints of			Able to engage in lifelong learning of		Slightly acquire programming skills by

	Programming with NumPy and String Handling methods to provide solutions to problems using Python at moderate level	applying the knowledge of Array Oriented Programming with NumPy and String Handling methods at moderate level	applications using Array Oriented Programming with NumPy and String Handling methods that help resolve various needs of the society at moderate level	Array Oriented Programming with NumPy and String Handling methods in developing applications using Python and apply them where appropriate			new features introduced with respect to Array Oriented Programming with NumPy and String Handling methods in Python independently to a slight extent	-	learning usage of Array Oriented Programming with NumPy and String Handling method s in Python
CO5	2	2	2	1	1	-	1	-	2
	Apply knowledge of File and Exception handling methods to provide solutions to problems using Python at moderate level	Solve application development use cases by applying the knowledge of File and Exception handling methods at moderate level	Be able to create and demonstrate Python based applications using File and Exception handling methods that help resolve various needs of the society at moderate level	Slightly understand the constraints of File and Exception handling methods in developing applications using Python and apply them where appropriate	Slightly communicate effective reports, design documents and presentations explaining the use of File and Exception handling methods via Project Based Learning		Able to engage in lifelong learning of new features introduced with respect to File and Exception handling methods in Python independently to a slight extent	-	Acquire programming skills by learning usage of File and Exception handling methods in Python at moderate level
Average	**1.8**	**1.6**	**1.6**	**0.7**	**0.2**	**0**	**1**	**0**	**1**

Discrete Mathematics (23B31MA112)

Relations, Equivalence Relations, Partial Ordered Set, Hasse Diagram, Lattice, Functions, Recursively Defined Functions, Generating functions, Z-Transforms, Propositions, Basic Logical Operators, Truth tables, Tautologies and Contradictions. Valid arguments and Fallacy, Propositional Functions and Quantifiers, Graphs, Subgraphs, Eulerian Graph and Konigsberg problem, Hamiltonian graph, Labelled and Weighted graphs. Tree Graphs-Minimum Spanning Tree (Prim's algorithm), Graph Colourings. Four Colour Problem, Trees, Digraphs, Rooted trees, Binary trees, Sequential representation, Adjacency Matrix, Path Matrix, Shortest Path.

Course Description

Course Code	**23B31MA112**	**Semester:** Even	**Semester -** II **Session** 2023-24 **Month from** Jan-May 2024
Course Name	Discrete Mathematics		
Credits	3	**Contact Hours**	3-0-0
Faculty (Names)	**Coordinator(s)**	Dr. Shashank Goel	
	Teacher(s) (Alphabetically)	Dr. Shashank Goel	
COURSE OUTCOMES: After the successful completion of this course, the student will be able to			**COGNITIVE LEVELS**
CO1	recall basics of set theory, functions and relations.		Remembering (C1)
CO2	explain lattices, generating function, propositional calculus, algebraic structure and graphs.		Understanding (C2)
CO3	solve the problems related to Z- transform, propositional calculus and algebraic structures.		Applying (C3)
CO4	analyse different graph theoretic algorithms for solving related problems.		Analyzing (C4)
Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Relations and Lattices	Relations and their composition. Pictorial representation, matrix and graphical representations. Equivalence relations and partitions. Transitive closure and Warshall's algorithm, Partial ordered relations and Hasse diagram. Lattices, Boolean algebra.	10
2.	Functions	Functions and recursively defined functions, generating functions, solution of recurrence relations by generating function. Z transforms, solution of difference equations by Z transform.	10
3.	Propositional Calculus	Propositions- simple and compound. Basic logical operators. Implication. Truth tables. Tautologies and contradictions. Valid arguments and fallacy. Propositional functions and quantifiers.	5

4.	Graphs	Graphs and related definitions, subgraphs, isomorphism, paths and connectivity. Eulerian graph and Konigsberg problem. Hamiltonian graph. Labelled and weighted graphs. Tree Graphs-Minimum spanning Tree (Prim's algorithm). Graph colorings. Four color problem.	7
5.	Directed Graphs	Trees, Digraphs and related definitions. Rooted trees. Binary trees, Sequential representation. Adjacency matrix. Path matrix. Shortest path.	5
6.	Algebraic Structures	Groups- definitions and examples, order of elements, subgroup, condition for subgroups, Rings, integral domains and Fields- definition and examples.	5
Total number of Lectures			**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, Tutorials, PBL)
Total	**100**

Project based learning: A group of 4 to 5 students will be formed. Each group will be assigned a problem related to the diversified applications of graph theory. Each group will submit a report of 6-7 pages.

Recommended Reading Material:

1.	**Lipschutz, S. and Lipson**, **M**., Discrete Mathematics, 2nd Edition, Tata McGraw-Hill, 1997.
2.	**Rosen, K. H.,** Discrete Mathematics and its Application, 7th Edition, Tata McGraw-Hill, 2011.
3.	**Liu, C. L**., Elements of Discrete Mathematics, 2nd Edition, Tata McGraw-Hill, 1998.
4.	**Kolman, B., Busby, R. C. and Ross, S.,** Discrete Mathematical Structures, 6th Edition, Prentice Hall, 2018.
5.	**Deo, N.,** Graph Theory, Prentice Hall, 2004.
6.	**Grimaldi, R.P.,** Discrete and Combinatorial Mathematics, 5th Edition, Pearson Education, 2011.

CO-PO and CO-PSO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	2	1	1				2		
CO2	2	2	1				2	1	
CO3	3	3	1			1	2	1	
CO4	3	3	1			2	2	1	
Avg	**2.5**	**2.25**	**1.00**			**1.50**	**2.00**	**1.00**	

DetailedSyllabus
Lab-wiseBreakup

CourseCode	**23B65CA124**	**Semester:II**	**Session 2024-25** **Month from January to December**
Course Name	**Data Structure Lab**		
Credits	**0-0-1**	**ContactHours**	**2**

Faculty(Names)	**Coordinator(s)**	Dr.Taj Alam
	Teacher(s) (Alphabetically)	Dr.Ankita Jaiswal, Dr. Sonal, Dr. Pawan Upadhyay, Ms. Jyoti Chauhan, Dr. Niyati Agarwal, Ms. Shagun Gupta

COURSEOUTCOMES		**COGNITIVE LEVELS**
CO1	Demonstrate concepts of C programming language.	Apply Level (C3)
CO2	Apply various linear data structures and their related operations to solve the real-world problems.	Apply Level (C3)
CO3	Apply various non-linear data structures and their related operations to solve the real-world problems.	Analyze Level (C4)
CO4	Choose appropriate data structure to solve a given problem.	Evaluate Level (C5)
CO5	Create an application that utilizes the data structures to efficiently solve real-world problems	Create Level (C6)

Module No.	Titleofthe Module	Topicsinthe Module	No. of Labs for themodule
1.	Introduction	**Lab1:**Programs based on Memory Allocation–Static and dynamic, pointer arithmetic, structures	1
2.	Linear Data Structures	**Lab-2:** Review of Arrays: One dimension, two-dimension, memory representation, address calculation, and related operations. **Lab-3-4:** Linked List: Singly, Doubly, Circular, and related operations like Creation, Insertion, Deletion, Modification, Searching, Sorting, Reversing, and Merging.	3
3.	Abstract data types	**Lab-5:** Stack: Static and dynamic implementation, operations, applications like conversion between polish and reverse polish notations. **Lab 6:** Queue: Static and dynamic implementation, operations, types: linear, circular, doubly ended.	2

4.	Searching and Sorting	**Lab7:** Searching–Review of Linear Search and Binary Search. Hashing – Hash Table, Chaining, Probing. **Lab 8:** Sorting – Merge, Quick, Radix, Bucket, and Count. Review of insertion, selection, bubble sort.	2
5.	Non-Linear Data Structures	**Lab 9-10:** Trees: Notations & Terminologies, Memory Representation, Binary Trees Types- Complete, Full, Strict. Tree Traversals (Recursive and non-recursive), Binary Search Tree and Basic Operations, Threaded Binary Tree. Balanced BST: AVL Tree, B Tree. Priority Queue using Binary Heaps. **Lab 11-12:** Graphs: Notations and Terminologies, Memory Representation: Adjacency Matrixand List; Graph Traversal using DFS and BFS.	4
TotalnumberofLabs			**12**

EvaluationCriteria

Components	**MaximumMarks**
Lab Test -1	**20**
LabTest-2	**20**
LabEvaluation-1	**10**
Mini-Project	**20**
LabEvaluation-2	**15**
Attendance	**15**
Total	**100**

Project Based Learning: Each student in a group of 3-4 will develop one project using some data structures and explaining the real time usage of the developed application. The project is to be assessed based on the data structures involved and mapping it to real time problem. This course will help students grow their technical skills in terms of implementation and in turn will help in employability like web development, algorithms design and efficiency improvement.

RecommendedReadingmaterial: Author(s),Title,Edition,Publisher,YearofPublicationetc.(Textbooks, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1	Dinesh P. Mehta and Sartaj Sahni, Handbook of Data Structures and Applications, 2nd Ed., Chapman and Hall/CRC Computer and Information Science Series, CRC Press
2	R.F Gilberg, and B A Frouzan- “Data Structures: A Pseudocode Approach with C”, Thomson Learning,Second Edition, 2004.
3	AlfredV.Aho,J.E.Hopcroft,JeffreyD.Ullman,DataStructuresandAlgorithms,Addison-WesleySeries inComputerScienceandInformationProcessing,1983
4	ThomasH.Cormen,CharlesE.Leiserson,RonaldL.Rivest,andCliffordStein,Introductionto Algorithms, MIT Press, 3rd Edition, 2009
5	E. Horowitz and S.Sahni,“ Fundamentals of Data Structures in C ”.Universities Press, Second edition, 2008.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
	1	1	1	1			1		1

CO1	Analysis ofproblemst oexplainthe need ofdifferentty pesofdatastr uctures	Analysere altimepro blemstosu ggestrele vantDatas tructures	Understand tocompare differentsol utionsforas ingleproble minhand	Explorediffer entoffline/ onlinetoolsav ailableforimp lementingsolu tions			Understand theneedforl earningDSi n real life		Understand the role ofDSatsoft warelevel to beembedde dasappropri atesolutionf orhardware towork
CO2	2	2	1	1			2		1
	Fundamentals ofstack,queue ,linkedlist	Analyseso lutionusin gstack,qu eueandlist s	UsingLin earDSdesi gnsolution efficientth anbrutefor ce	Usedifferento ffline/ onlinetoolsav ailableforimp lementingsolu tionsusingLin earDS			Applylinear DSand mapthemto differentreal - lifescenario stoundersta ndtheirimpa ctonbetterm entoflife		Developsol utionsusing LinearDSa tsoftwarele vel to beembedde dasappropr iatesolution forhardwar e towork
CO3	2	2	1	1			2		1
	Fundamentals of Multi list,treeandgr aphs	Analyses olutionusi ngMultili st,treeand graphs	UsingNon - LinearDS designsol utioneffici entthanbr uteforce	Usedifferento ffline/ onlinetoolsav ailableforimp lementingsolu tionsusingNo n-LinearDS			ApplyNon- LinearDSa nd mapthemto differentreal - lifescenario stoundersta ndtheirimpa ctonbetterm entoflife		Developsol utionsusing Non- LinearDSa tsoftwarele vel to beembedde dasappropr iatesolution forhardwar e towork
CO4	2	2	1	1	2	1	3		1
	Mappingappr opriateDSacc ordingtoprob leminhand	Identifyw hichDSis suitablefo rtheprobl em	ApplyDS w.r.t.whic hasolution canbedev elopedfor aproblem	Usedifferento ffline/ onlinetoolsav ailableforimp lementingsolu tionsusingvar iousDatastruc tures	Engineer solution toreal time problemsusingappropr iateDS/that's of societalusage	PBL componentto apply alllearned DStolearnpr ojectmanage mentandtea mwork	Developsolu tiontoreallif eapplication susingcombi nationofdiff erentDS		Developsol utionsusing variousDS atsoftwarel evel to beembedde dasappropr iatesolution forhardwar etowork
CO5	3	3	2	1	3	1	3		1
	Assessdiffe rentapproa chesonasin gleproblem	Analyseat DSlevelusi ngpseudoti me/ spacecalcul ation	Choosebe stDSw.r.t. whichmo stefficient solutionc anbeprop osed	Usedifferento ffline/ onlinetoolsav ailableforimp lementingand analysingsolu tionsusingvar iousDatastruc tures	Engineereffectivesolu tion to real timeproblemsusingap propriateDS/that'sof societal usage	PBL componentto developthe mostefficien tsolutionusin galllearned DStolearnpr ojectmanage mentandtea mwork	Developand analysesolut iontoreallife applications usingcombi nationofdiff erentDS		Assesssolut ionsusingv ariousDSat softwarele vel to beembedde dasappropr iatesolution forhardwar etowork

Detailed Syllabus
Lab-wise Breakup

Course Code	**23B65CA125/ 23B65CS125**	**Semester: EVEN**	**Semester: II** **Session: 2024-25** **Month from Jan to June**
Course Name	**Database Management Systems Lab**		
Credits	**0-0-1**	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	**SILKI KHARALIYA**
	Teacher(s) (Alphabetically)	**ANIL KUMAR MAHTO, PRATIK SHRIVASTAVA, SHIKHA JAIN, SHIVENDRA VIKRAM SINGH, SILKI KHARALIYA, IMRAN RASHEED, NEETU SINGH, NOOR MOHAMMAD**

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Discuss the basic constructs of Structured Query Language.	Understand (Level II)
CO2	Use simple and complex queries using DDL, DML, DCL and TCL.	Apply (Level III)
CO3	Exercise SQL Joins, Clauses, and Subqueries.	Apply (Level III)
CO4	Practice stored procedures, stored functions, cursors, Triggers on different problem.	Apply (Level III)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Introduction to MySQL commands.	MySQL Create command, Data Types, Constraints, Alter, Drop, Rename Statements.	**CO1** Understand (Level II)
2.	SQL-DML	Select database, show and describe tables. DML Commands- Select, Insert, Update, Delete.	**CO2** Apply (Level III)
3.	Conditions and Logical Operators	Specifying conditions with Where keyword, AND, OR, NOT, BETWEEN, IN, NOT IN etc.	**CO2** Apply (Level III)
4.	SQL Aggregate Functions	Date and Time functions, Numeric, String, Conversion functions like Count, Min, Max, Avg, Sum etc.	**CO2** Apply

			(Level III)
5.	SQL Joins	Cross Join, Natural Join, Inner Join, Outer Join.	**CO3** Apply (Level III)
6.	SQL Clauses	Sorting Results (ORDER BY Clause), Grouping Results (GROUP BY Clause), ANY and ALL, Combining Result Tables (UNION, INTERSECT, EXCEPT).	**CO3** Apply (Level III)
7.	Subqueries	Basic Subqueries, multiple column subqueries, subqueries with Having and group by clause.	**CO3** Apply (Level III)
8.	Procedural Language	1. Write PL/SQL program for storing data using procedures. 2. Write PL/SQL program for storing data using stored functions. 3. Write PL/SQL program for storing data using cursors and Triggers	**CO4** Apply (Level III)

Evaluation Criteria

Components	**Maximum Marks**
Lab Test-1	**20**
Lab Test-2	**20**
Lab Evaluation-1	**15**
Lab Evaluation-2	**15**
PBL	**20**
Attendance	**10**
Total	**100**

Project based leaning: Groups of 3-4 students will choose a project topic. They will use the concepts of database and Structured Query Language to execute their project.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Henry F Korth, Abraham Silberschatz, S. Sudurshan, Database system concepts, 7th Edition, McGraw-Hill,2019
2.	Ramez Elmasri , Shamkant B. Navathe , Fundamentals of Database Systems, 5th Edition, Pearson Education, 2015.
3.	Ramakrishnan, Gehrke, Database Management Systems, Mcgraw-Hill, 3rd Edition, AddisonWesley, 2014.
4.	Thomas Connolly, Carolyn Begg, Database Systems-A Practical Approach to design, Implementation and Management, 6rd Edition, Addison-Wesley,2015.

CO-PO-PSO Mapping									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	**1**		**1**				**1**		
	It focuses on understanding MySQL basics.		Understanding database language is necessary for designing database.				It slightly contributes to lifelong learning.		
CO2	**2**	**2**	**1**	**2**			**1**		**1**
	It aligns with executing queries.	It involves problem analysis to execute complex queries.	It slightly contributes to designing applications that involve database.	It aligns with database management software..			It aligns with lifelong learning.		It contributes to database development for web and mobile applications.
CO3	**2**	**2**	**1**	**2**			**1**		**1**
	It aligns with executing queries..	It involves problem analysis to execute complex queries.	It slightly contributes to designing applications that involve database	It aligns with database management software			It aligns with lifelong learning..		It contributes to database development for web and mobile applications.
CO4	**2**	**2**	**2**	**2**			**1**		**2**
	It align with applying basic knowledge.	It involves problem analysis.	It contributes to designing applications that involve database	It uses modern tool for designing database.			It aligns with lifelong learning	.	It contributes to database development for web and mobile applications.
Avg.	**1.75**	**2**	**1.25**	**2**			**1**		**1.33**

Detailed Syllabus Lab-wise Breakup

Subject Code	23B65CA126	**Semester: Even**	**Semester: 2nd Session:** 2024-25 **Month:** Jan 2025 to June 2025
Subject Name	Python 1 Lab		
Credits	**1**	**Contact Hours**	**0-0-2**

Faculty (Names)	**Coordinator(s)**	Richa Kushwaha
	Teacher(s) (Alphabetically)	Dr. Alka Singhal, Dr. Deepika Varshney, Ms. Neetu Singh, Dr. Rajiv Mishra, Ms. Richa Kushwaha, Ms. Shagun Gupta, Dr. Shardha Porwal, Mr. Sumeshwar Singh

COURSE OUTCOMES At the completion of the course, students will be able to		**COGNITIVE LEVELS**
C156.1	Discuss the usage of data types, variables, operators and conditional statements to write Python programs	Understand (level 2)
C156.2	Demonstrate the use of control statements, understand the process of defining and call functions and develop proficiency in importing and utilizing Python modules.	Apply (level 3)
C156.3	Explore and solve real-world problems using various data structures of Python	Analyze (level 4)
C156.4	Explain the usage of files, including CSV and JSON files and exception handling and data visualization using Matplotlib & Seaborn to solve problems using Python scripts.	Evaluate (level 5)
C156.5	Construct the solutions for practical problems using various python programming constructs	Create (level 6)

Module No.	**Subtitle of the Module**	**Topics in the Module**	**No. of Labs for the module**
1	Variables, operators and conditional Statements	Writing your first 'Hello World' Program Python Indentation Python Comments Getting input from user Variables Operators Conditional Statements - if, else	2
2	Control Statements	Control Statements - while, for range function, break and continue	1
3	Sequences	Lists Tuples	1

4	Dictionaries and Sets	Creating a Dictionary Iterating through a Dictionary Basic Dictionary Operations Dictionary Comparisons Comparing Sets Mathematical Set Operations Mutable Set Operators and Methods	1
5	Functions	Functional-Style Programming Recursion Passing Data Structures to Functions	1
6	Array-Oriented Programming with NumPy	Creating arrays Array Attributes Array Operators NumPy Calculation Methods Universal Functions Indexing and Slicing	1
7	Strings	Formatting Strings Concatenating and Repeating Strings Stripping Whitespace from Strings Changing Character Case Comparison Operators for Strings Searching for Substrings Replacing Substrings Splitting and Joining Strings	1
8	Files and Exceptions	Writing to a Text File Reading Data from a Text File Updating Text Files Handling Exceptions Division by Zero and Invalid Input try Statements Catching Multiple Exceptions in One except Clause What Exceptions Does a Function or Method Raise? What Code Should Be Placed in a try Suite? finally Clause Explicitly Raising an Exception Stack Unwinding and Tracebacks Reading, Writing and Exception Handling with CSV and JSON Files	3
9	Data Visualization	Creating Data Visualization using Matplotlib & Seaborn	1
Total number of Labs			15

Evaluation Criteria	
Components	**Maximum Marks**
Eval 1	15
Eval 2	15
Lab Test 1	20
Lab Test 2	20
PBL	20 (Students will submit the mini project in a group of 3-4 members)
Attendance	10
Total	**100**

Project based learning: Create a Python application either individually or in groups of maximum 4 students each, to illustrate the concepts covered in class.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
	Text Books
1	Paul Deitel and Harvey Deitel: *Python for Programmers*, 1st Edition, Deitel Developer Series, 2020.
2	Allen Downey: *Think Python*, 2nd Edition, O'Reilly, 2015.
	Reference Books
1	Paul Barry: *Head First Python*, 3rd Edition, O'Reilly, 2023.
2	Erric Matthes: *Python Crash Course,* 3rd Edition, No Starch Press, 2023.

CO-PO and CO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	2	2	2	1	-	1	1	2	2
	Apply fundamental knowledge of variables and operators to develop Python based applications	Analysis of problems and solve them using Python variables and operators	Create and demonstrate Python based applications using variables and operators that help resolve various needs of the society at moderate level	Understand the constraints of variables and operators in developing applications using Python and apply them where appropriate		Use the concepts of variables and operators in Project Based Learning	Engage in lifelong learning of new features introduced with respect to variables and operators in Python	Develop softwares in AIML using Python basic constructs.	Acquire programming skills by learning usage of variables and operators in Python at moderate level
CO2	2	2	2	1	-	1	1	2	2
	Apply fundamental knowledge of control statements and functions to develop Python based applications	Analysis of problems and solve them using Python control statements and functions	Create and demonstrate Python based applications using control statements and functions that help resolve various needs of the society at moderate level	Understand the constraints of control statements and functions in developing applications using Python and apply them where appropriate		Use the concepts of control statements and functions in Project Based Learning	Engage in lifelong learning of control statements and functions	Develop softwares in AIML using Python basic constructs.	Acquire programming skills by learning usage of control statements and functions in Python
CO3	2	2	2	1	-	2	1	1	2
	Apply fundamental knowledge of sequences and strings to develop Python based applications	Conduct the analysis of problems and solve them using Python sequences and strings	Create and demonstrate Python based applications using sequences and strings that help resolve various needs of the society at moderate level	Understand the constraints of sequences and strings in developing applications using Python and apply them where appropriate		Use the concepts of sequences and strings in Project Based Learning	Engage in lifelong learning of sequences and strings in Python	Develop softwares in AIML using Python basic constructs.	Acquire programming skills by learning usage of sequences and strings in Python
CO4	2	2	2	1	-	2	1	1	2
	Apply knowledge of Python concepts to provide solution to problems	Conduct the analysis of problems and solve them using Python exceptions and visualizations	Demonstrate Python based applications using exceptions and visualizations that help resolve various needs of the society at moderate level	Understand the constraints of exceptions and visualizations in developing applications using Python and apply them where appropriate		Use the concepts of exceptions and visualizations in Project Based Learning	Engage in lifelong learning of exceptions and visualizations in Python	Develop softwares in AIML using Python basic constructs.	Acquire programming skills by learning usage of exceptions and visualizations in Python
CO5	2	2	2	2	2	2	1	2	2
	Apply knowledge of Python concepts to provide solution to problems	Identify and analyze problems and solve them using Python concepts	Design computer applications that meet the various needs of society at moderate level using Python	Understand the constraints of developing applications using Python and apply them where appropriate	Moderately communicate effective reports, design documents and presentations via Project Based Learning using Python concepts	Apply project management principles in Project Based Learning using Python concepts	Engage in independent and lifelong learning of new features introduced in Python to a slight extent	Develop softwares in AIML using Python basic constructs.	Acquire programming skills using Python at moderate level
Average	**2.00**	**2.00**	**2.00**	**1.20**	**2.00**	**1.60**	**1.00**	**1.60**	**2.00**

Detailed syllabus
Lecture-wise Breakup

Subject Code	**23B36HS111**	**Semester: EVEN**	**Semester 2nd Session 2024-25** **Month from Jan to June**
Subject Name	**EVERYDAY PSYCHOLOGY**		
Credits	**2**	**Contact Hours**	**2-0-0**
Faculty (Names)	**Coordinator(s)**	**Dr. Badri Bajaj**	
	Teacher(s) (Alphabetically)	**Dr. Badri Bajaj**	

COs (NBA Code)		Description
C111.1	Understand human behavior and components that constitute self and social relationships	Understanding Level (C2)
C111.2	Apply psychological concepts to understand challenges at the level of self and inter-personal relationships	Applying Level (C3)
C111.3	Analyze the role of various psychological and lifestyle related strategies for promoting living with peace and balance	Analyzing Level (C4)
C111.4	Evaluate the role of social norms and perceptions in shaping our behaviors and thinking	Evaluating Level (C5)

Module No.	**Subtitle of the Module**	**Topics in the module**	**No. of Lectures for the module**
1.	Introduction to Everyday Psychology	Use and Purpose of psychology in everyday life, Understanding behavior	**3**
2.	Understanding Self	Basic Human Emotions, Self-esteem Core – Self Evaluation	**3**
3.	Identity	Identity and its formation, Identity conflict	**2**
4.	Personality	Personality, types of Personality, Proactive Personality	**3**
5.	Morality	Development of Moral Reasoning and Moral Dilemmas	**2**
6.	Social context of Development	Socio-cultural theory, Context of Development – Family, Peers and Schooling, Media	**4**
7.	Relationships	Family Relationships Relationship Struggles	**2**
8.	Mental Health	Concept of mental health, taboos around mental issues, mental health concerns - Body Image, Loneliness, Anxiety, Sadness vs Depression, Abuse	**5**
9.	Coping with Mental health issues	Coping Strategies, Role of counselling, Self-Regulation	**4**
Total number of Hours			**28**
Evaluation Criteria **Components** **Maximum Marks**			

T1	20
T2	20
End Semester Examination	35
TA	25 (Project, Assignment/Quiz)
Total	**100**

Project based learning: Based on concepts studied in the course, analyze yourself and list out specific steps that you need to take for achieving higher levels on at least four concepts of the course. Be detailed and reflective about your personal experiences and support you answer from personal life experiences that you would like to share. Seek support from a peer group and family for analysis and for listing specific steps for improvement.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	W. Weiten, and M. A. Lloyd, Psychology Applied to Modern Life: Adjustment in the 21st Century, Wadsworth Publishing, 2007
2.	R. Harington, Stress, Health and well-being: Thriving in the 21st century, Wadsworth Publishing, 2013.
3.	Tavris, C., & Aronson, E. (2007). Mistakes were made (but not by me): Why we justify foolish beliefs, bad decisions, and hurtful acts. Harcourt.
4.	Aronson, E. (1994). The social animal (7th ed.). W H Freeman/Times Books/ Henry Holt & Co.
5.	Myers, D. G. (1999). *Social psychology* (6th ed.). McGraw-Hill.

Detailed Syllabus

Lecture-wise Breakup

Course Code	**24B31HS112**	**Semester Even**	**Semester II Session 2024-25 Month from Jan 2025 to June 2025**	
Course Name	**Soft Skills -I**			
Credits	**2**	**Contact Hours**	**1-0-2**	
Faculty (Names)	**Coordinator(s)**	Dr. Shikha Kumari		
	Teacher(s) (Alphabetically)	Dr. Paridhi Chaudhary Dr. Shikha Kumari		

COURSE OUTCOMES		**COGNITIVE LEVELS**
C160.1	Understand various aspects of soft skills and professional etiquettes and learn ways to develop personality	Understanding Level (C2)
C160.2	Apply stress and time management skills for better performance	Applying Level (C3)
C160.3	Analyze leadership skills and styles to survive and excel in professional life	Analyzing Level (C4)
C160.4	Evaluate decision making techniques, negotiation styles	Evaluating Level (C5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures**
1.	Introduction to Soft Skills	Introduction, Personality Development: Knowing Yourself, Positive Thinking, Emotional Intelligence, Component of Emotional Intelligence, Skills to Develop Emotional Intelligence SWOT Analysis	3
2.	Professional Etiquette	How to behave digitally and socially in the professional world – Email, Telephonic, Office, Digital, Social	3
3.	Stress and Time Management	Stress, Sources of Stress, Ways to Cope with Stress, Goal setting and prioritization, Short-term and longterm goals, and Implementing Goals.	3

4.	Decision Making and Negotiation	Introduction to Decision Making, Steps for Decision- Making, Decision-Making Techniques, Negotiation Fundamentals, Negotiation Styles, and Major Negotiation Concepts	3
5.	Leadership and Team Building	Leader and Leadership, Leadership Traits, Culture and Leadership, Leadership Styles and Trends, Team Building, Types of Teams	2
		Total number of Lectures	**14**

Evaluation Criteria

Components	**Maximum Marks**
Mid Term	30 (Lab Based Assessment)
End Semester Examination	40
TA	30 (Quiz, Assignments, Project & Participation) **Total** **100**

PBL Component: The project is to be done in a group of 4-6 students. They will be asked to write a report related to various skills implementation in their workplace.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication, etc. (Text books, Reference Books, Journals, Reports, Websites, etc)

1.	P. Sharma, *Soft Skills 3rd Edition: Personality Development for Life Success* (English Edition), 3rd ed. New Delhi: BPB Publications, 2021.
2	L. U. B. Pandey, *Practical Communication*, 1st ed. Delhi: A.I.T.B.S. Publications India Ltd., 2013.
3.	B. K. Mitra, *Personality Development & Soft Skills*, 1st ed. New Delhi: Oxford University Press, 2012.
4.	W. S. Pfeiffer, *Public Speaking*, 1st ed. Delhi: Pearson, 2012.
5.	S. Sharma et al., *Communication Skills for Engineers and Scientists*, 1st ed. New Delhi: THI Learning Pvt Ltd, 2011.
6.	https://www.osou.ac.in/eresources/Soft-Skills-ccs04.pdf

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1					2	2	2		2
CO2					2	2	2		2
CO3					2	2	2		2

CO4					2	2	2		2
Avg					2.00	2.00	2.00		2.00