

Second Year B. Tech CSE

Subject: Discrete Mathematics

Subject Code: BTCOC302

Course Outcomes (COs):-

Upon completion of this course, students will be able to	
CO1	Use propositional and predicate logic in knowledge representation and truth verification.
CO2	Perform operations on discrete structures such as functions & relations.
CO3	Demonstrate the knowledge of fundamental concepts in graph.
CO4	Demonstrate the knowledge of fundamental concepts in tree.
CO5	Illustrate the algebraic systems – Semigroups , Monoids & Groups.

CO-PO Mapping:-

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	2													
2	3	2													
3	3	2													
4	3	2													
5	3	2													
AVG	3	2													

CO-PO Mapping Justification:-

CO No	PO/PSO	CL	JUSTIFICATION
1	PO 1	3	The validity of facts can be verified using predicate and Propositional logic. The reasoning and inferences made by them can be substantiated by the various proof techniques. Hence it is mapped on high scale.
	PO 2	2	The proof techniques can be used to verify the complex engineering solutions. Knowing logic will help in Communicating effectively on complex engineering activities. Hence it is mapped on medium scale.
2	PO1	3	The concept of relations and functions is used in their core subjects; hence it is mapped on high scale.
	PO 2	2	Using the concept of relations and functions, students are able to solve the problems arising in their domains. Hence it is mapped on medium scale.
3	PO1	3	The concept of Graph theory is used to represent network of communication, hence it is mapped on high scale.
	PO2	2	The concept of Graph theory is helpful tool to simplify complex engineering problems arising in their field.
4	PO1	3	The concept of tree is used to represent different outcomes in a decision-making scenario. Hence it is mapped on high scale.
	PO2	2	The concept of tree is helpful tool to simplify complex engineering problems arising in their field.
5	PO 1	3	The concept of algebraic systems is used in binary operations; hence it is mapped on high scale.
	PO 2	2	The concept of tree is helpful tool to simplify complex engineering problems arising in their field.

Shri. Balasaheb Mane Shikshan Prasarak Mandal's
ASHOKRAO MANE GROUP OF INSTITUTIONS
FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
NH – 4, Wathar Tarf Vadgaon, Tal: - Hatkanangale, Dist: - Kolhapur - 416112.
Phone: (0230) 2407740, 2407750, 2407760 Fax: (0230) 2407750

Subject: DATA STRUCTURES

Subject Code: BTCOC303

Course Outcomes (COs):-

Upon completion of this course, students will be able to	
CO1	Understand fundamentals of data structures and their applications essential for programming/problem solving.
CO2	Apply Linear Data Structures: Stack, Queues and Recursion.
CO3	Apply Linear Data Structures: Linked Lists.
CO4	Apply Non-Linear Data Structures: Trees and Graphs.
CO5	Understand the concepts of Searching, Hashing, Files and their Organization and Sorting Algorithms.

CO-PO-PSO Mapping:-

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3											2		1	
CO2	3													1	
CO3	3													1	
CO4	3	2												1	
CO5	3													1	
Avg.	3	2										2		1	

CO-PO Mapping Justification:-

CO No	PO/PSO	CL	JUSTIFICATION
1	PO 1	3	Strongly mapped as the knowledge in fundamental programming methodologies help students in designing solutions for complex engineering problems.
	PO 12	2	Moderately mapped as Information acquired from the fundamentals of Data Structures provides lifelong learning in the context of technological change.
	PSO 2	1	Slightly mapped as students will have the knowledge in programming methodologies help in designing solutions and analyzing its complexity.
2	PO1	3	Strongly mapped as students will have the knowledge of stacks and queues can be applied to solve complex engineering problems.
	PSO2	1	Slightly mapped as students will have the knowledge of stacks and queues which can be applied to design solutions to complex engineering problems in multidisciplinary areas.
3	PO1	3	Strongly mapped as students gain knowledge of different Linked list operations.
	PSO2	1	Slightly mapped as students will gain the knowledge of linear data structures like linked lists which can be applied to design solutions to complex engineering problems.
4	PO1	3	Strongly mapped as students could apply the knowledge of various non- linear data structures like trees and graphs
	PO2	2	Moderately mapped as students use the knowledge of trees and graphs in problem analysis.
	PSO2	1	The knowledge of non-linear data structures like trees and graphs can be applied to design solutions to complex engineering problems.
5	PO1	3	The knowledge of various hashing techniques can be applied in designing solutions to complex engineering problems.
	PSO2	1	Slightly mapped as students gain the knowledge of various sorting and hashing techniques can be applied in designing solutions to complex multidisciplinary engineering problems.

**Shri. Balasaheb Mane Shikshan Prasarak Mandal's
ASHOKRAO MANE GROUP OF INSTITUTIONS
FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
NH – 4, Wathar Tarf Vadgaon, Tal: - Hatkanangale, Dist: - Kolhapur - 416112.
Phone: (0230) 2407740, 2407750, 2407760 Fax: (0230) 2407750**

Subject: Computer Architecture and Organization Subject Code: BTCOC304

Course Outcomes (COs):-

CO	DESCRIPTION (Student should be able to...)
1	Understand the theory and architecture of central processing unit.
2	Understand the instruction set format and its architecture
3	Design a simple CPU with applying the theory concepts.
4	Understand memory organization in computer.
5	Understand the architecture and functionality of central processing unit and I/O and memory organization.

CO-PO Mapping:-

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3												3		
2		2											2		
3				2									2		
4							3						3		
5							2						2		

CO-PO Mapping Justification:-

CO	Justification of mapping		
	1: Slight (Low)	2: Moderate (Medium)	3: Substantial (High)
1			The graduates will possess the knowledge of various discrete mathematical structures, logic, and numerical techniques. The graduates will possess knowledge of advanced and emerging topics in the fields of operating systems, databases, and computer networks.
2		The graduate will have a broad understanding of the impact of computer-based solutions in Identify, formulate, and analyze complex engineering problems reaching substantiated conclusions.	
3		The graduates will have an ability to analyze problems, specify algorithmic solutions to them, and evaluate alternative solutions.	
4			The graduates will possess knowledge of advanced and emerging topics in the fields of operating systems, databases, and computer networks.
5		The graduates will possess knowledge of advanced and emerging topics in the fields of operating systems, databases, and computer networks.	

Shri. Balasaheb Mane Shikshan Prasarak Mandal's
ASHOKRAO MANE GROUP OF INSTITUTIONS
FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
NH – 4, Wathar Tarf Vadgaon, Tal: - Hatkanangale, Dist: - Kolhapur - 416112.
Phone: (0230) 2407740, 2407750, 2407760 Fax: (0230) 2407750

Subject: Object – Oriented Programming in C++

Subject Code: BTCOC305

Course Outcomes (COs):-

Upon completion of this course, students will be able to

CO1	Understand object-oriented approach, Characteristics of object-oriented languages, class, Objects As data types, Constructors.
CO2	Understand unary and binary operators, Data conversion. Derived and base class, Public and private inheritance, Levels of inheritance, multiple inheritance Examples.
CO3	Understand Virtual functions, Dynamic binding, Abstract classes and pure virtual functions, Friend functions, this pointer.
CO4	Understand Streams, Stream output and input, Stream manipulators, Files and streams, Creating, Reading, Updating sequential and random files.
CO5	Understand Templates, Exception Handling and STL.

CO-PO-PSO Mapping:-

CO	PO												PSO			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3															
CO2					3									3		
CO3				2												
CO4							2									
CO5											3	2				
Avg.	3			2	3		2				3	2		3		

CO-PO Mapping Justification:-

CO	PO/PSO	CL	JUSTIFICATION
1	PO1	3	Strongly mapped students are getting knowledge at high level of engineering Problems.
2	PO5	1	Slightly mapped as students will have the knowledge in modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an Understanding of the limitations.
	PSO2	3	Strongly mapped as students will have the Knowledge of programming languages Demonstrate the knowledge of programming languages in computer based
3	PO4	2	Moderately mapped as Information Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
	PO5	3	Strongly mapped students Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
4	PO7	2	Moderately mapped as student's environment and sustainability to understand the Impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
5	PO12	2	Strongly mapped as students will have life-long learning recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change
	PO11	3	Strongly mapped as the knowledge in Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.