Lovely Professional University, Punjab

Course Code	Course Title	Lectures	Tutorials	Practicals	Credits	
CSE357	COMBINATORIAL STUDIES	2	0	2	3	
Course Weightage	ATT: 5 CA: 25 MTT: 20 ETT: 50					

Course Outcomes :Through this course students should be able to

CO1 :: understand the fundamental computer science concepts, including data structures, algorithms, databases, operating systems, and computer networks, essential for technical interviews.

CO2 :: assess the problem-solving skills specific to coding challenges and algorithmic problems frequently encountered in technical interviews.

CO3 :: articulate a comprehensive command of Object-Oriented Programming principles, enhancing readiness to excel in technical interviews

CO4 :: gain comprehensive strategies and techniques to effectively prepare for technical interviews, including mock interviews, resume building, and effective communication during interviews.

CO5 :: impart the requisite knowledge and skills to confidently address technical interview inquiries posed by service-oriented IT companies, demonstrating proficiency across diverse technical domains.

CO6 :: prepare and practice sessions including mock interviews, whiteboard coding exercises, and simulations of behavioural interview scenarios, fostering confidence and preparedness for different stages of technical interviews.

	TextBooks (T)		
Sr No	**Title**	**Author**	**Publisher Name**
T-1	IT INTERVIEW QUESTIONS	NARASIMHA KARUMANCHI	CAREERMONK PUBLICATIONS

	Reference Books (R)		
Sr No	**Title**	**Author**	**Publisher Name**
R-1	CRACKING THE CODING INTERVIEW	MCDOWELL GAYLE LAAKMANN	CAREERCUP
R-2	CRACKING THE IT INTERVIEW	M BALASUBRAMANIAM, K. R BAALAJI, KIRAN. G RANGANATH, NANDAWAT RAVINDRA K, M SELVAGURU, T COMERICA SUBASH, RAGHAVAN S VENKAT, S ANBAZHAGAN VIKRAM	MC GRAW HILL

R-3	SQL IN 10 MINUTES, SAMS TEACH YOURSELF	BEN FORTA	SAMS PUBLISHING
R-4	MCQS IN COMPUTER SCIENCE	TIMOTHY WILLIAMS	MC GRAW HILL

Relevant Websites (RW)		
Sr No	**(Web address) (only if relevant to the course)**	**Salient Features**
RW-1	https://www.tutorialspoint.com/operating_system/os_overview.htm	Introduction to OS and its Basics
RW-2	https://www.javatpoint.com/operating-system	Understanding Job Scheduling and Process Loading, Processor Scheduling Algorithms, Process Synchronization
RW-3	https://www.javatpoint.com/computer-network-tutorial	Basics of Computer Networking and IP
RW-4	https://www.tutorialspoint.com/data_communication_computer_network/index.htm	Data Communication and Networking
RW-5	https://www.javatpoint.com/dbms-tutorial	Introduction to DBMS with full concept
RW-6	https://www.tutorialspoint.com/dbms/index.htm	DBMS Concepts
RW-7	https://techdevguide.withgoogle.com/paths/foundational/	Fundamentals of Programming Languages
RW-8	https://www.freecodecamp.org/news/what-is-programming-tutorial-for-beginners/	Programing Basics
RW-9	https://www.tutorialspoint.com/data_structures_algorithms/index.htm	Data Structures and Algorithms Tutorial
RW-10	https://www.javatpoint.com/data-structure-tutorial	Data Structures Tutorials
RW-11	https://www.boardinfinity.com/blog/advanced-algorithms-and-problem-solving-techniques/	Problem Solving Techniques
RW-12	https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm	Design and Analysis of Algorithms

Audio Visual Aids (AV)		
Sr No	**(AV aids) (only if relevant to the course)**	**Salient Features**
AV-1	https://www.youtube.com/watch?v=a2B69vCtjOU&list=PLyqSpQzTE6M9SYI5RqwFYtFYab94gJpWk&index=2	Operating System Introduction and Eploring all the topics
AV-2	https://www.youtube.com/watch?v=lnU-Zw3NEEQ&list=PLbRMhDVUMngf-peFloB7kyiA40EptH1up&index=2	Computer Networking Full course
AV-3	https://www.youtube.com/watch?v=sEaYXwmsLw0&list=PLyqSpQzTE6M-xymXgqewlzcC3U4cdRoSu	DB System Concepts and understandings
AV-4	https://www.youtube.com/watch?v=vmxTUhn2fBg&list=PLqu1LEUz3ju04dXn0JOgKYPHHnV2at-lG	Programming In Modern C++
AV-5	https://www.youtube.com/watch?v=zWg7U0OEAoE&list=PLBF3763AF2E1C572F	Lecture Series on Data Structures and Algorithms
AV-6	https://www.youtube.com/watch?v=gY0MwGLq9W8&list=PLyqSpQzTE6M9DKhN7z2fOpKTJWu-639_P	Problem Solving Algorithm Design Full Content

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

LTP week distribution: (LTP Weeks)	
Weeks before MTE	
Weeks After MTE	
Spill Over (Lecture)	

Detailed Plan For Lectures

Week Number	Lecture Number	Broad Topic(Sub Topic)	Chapters/Sections of Text/reference books	Other Readings, Relevant Websites, Audio Visual Aids, software and Virtual Labs	Lecture Description	Learning Outcomes	Pedagogical Tool Demonstration/ Case Study / Images / animation / ppt etc. Planned	Live Examples
Week 1	Lecture 1	Operating System Basics (Foundations of Operating Systems)	T-1 R-1 R-2 R-4	RW-1	Foundations of Operating Systems, Types of Operating Systems, Memory Management	Students will be able to understand the basics of Operating systems and types, brief about memory management	PPT	
		Operating System Basics (Types of Operating Systems)	T-1 R-1 R-2	RW-1	Foundations of Operating Systems, Types of Operating Systems, Memory Management	Students will be able to understand the basics of Operating systems and types, brief about memory management	PPT	
		Operating System Basics (Memory Management)	T-1 R-1 R-2	RW-1	Foundations of Operating Systems, Types of Operating Systems, Memory Management	Students will be able to understand the basics of Operating systems and types, brief about memory management	PPT	
	Lecture 2	Operating System Basics (Job Scheduling and Process Loading)	T-1 R-1 R-2	RW-2 AV-1	Job Scheduling and Process Loading, Processor Scheduling Algorithms, Process Synchronization and Inter-process Communication,	Student remembers and apply the concept of OS in Problem solving	PPT A-V	
		Operating System Basics (Processor Scheduling Algorithms)	T-1 R-1 R-2	RW-2 AV-1	Job Scheduling and Process Loading, Processor Scheduling Algorithms, Process Synchronization and Inter-process Communication,	Student remembers and apply the concept of OS in Problem solving	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 1	Lecture 2	Operating System Basics (Process Synchronization and Inter-process Communication)	T-1 R-1 R-2	RW-2 AV-1	Job Scheduling and Process Loading, Processor Scheduling Algorithms, Process Synchronization and Inter-process Communication,	Student remembers and apply the concept of OS in Problem solving	PPT A-V	
Week 2	Lecture 3	Operating System Basics (Resource Management)	T-1 R-1 R-2	RW-1 RW-2 AV-1	Resource Management, Disc structure and Scheduling, Protection mechanisms	Student will be knowing tne Resource Management, Disc structure and Scheduling, Protection mechanisms	PPT A-v	
		Operating System Basics (Disc structure and Scheduling)	T-1 R-1 R-2	RW-1 RW-2 AV-1	Resource Management, Disc structure and Scheduling, Protection mechanisms	Student will be knowing tne Resource Management, Disc structure and Scheduling, Protection mechanisms	PPT A-v	
		Operating System Basics (Protection mechanisms)	T-1 R-1 R-2 R-4	RW-1 RW-2 AV-1	Resource Management, Disc structure and Scheduling, Protection mechanisms	Student will be knowing tne Resource Management, Disc structure and Scheduling, Protection mechanisms	PPT A-v	
	Lecture 4	Computer Networking Basics(Foundations of Computer Networks,)	T-1 R-1 R-2 R-4	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	
		Computer Networking Basics(Elements and Types of Networks,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 2	Lecture 4	Computer Networking Basics(Data and Signals,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	
		Computer Networking Basics(Network Topologies and Transmission Medium,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	
		Computer Networking Basics(Network Models and Protocols,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	
Week 3	Lecture 5	Computer Networking Basics(Foundations of Computer Networks,)	T-1 R-1 R-2 R-4	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	
		Computer Networking Basics(Elements and Types of Networks,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 3	Lecture 5	Computer Networking Basics(Data and Signals,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	
		Computer Networking Basics(Network Topologies and Transmission Medium,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	
		Computer Networking Basics(Network Models and Protocols,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Foundations of Computer Networks, Elements and Types of Networks, Data and Signals, Network Topologies and Transmission Medium, Network Models and Protocols,	Student can understand and Analyze the Networking Protocols and Basics	PPT A-V	
	Lecture 6	Computer Networking Basics(Understanding OSI and TCP/IP Models,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Understanding OSI and TCP/IP Models, Working of TCP/IP Model (Internet)	Students will learn about Understanding OSI and TCP/IP Models, Working of TCP/IP Model (Internet)	PPT A-V	
		Computer Networking Basics(Working of TCP/IP Model (Internet),)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Understanding OSI and TCP/IP Models, Working of TCP/IP Model (Internet)	Students will learn about Understanding OSI and TCP/IP Models, Working of TCP/IP Model (Internet)	PPT A-V	
Week 4	Lecture 7	Computer Networking Basics(Subnetting and Routing,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	Students will understand and gain knowledge about Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 4	Lecture 7	Computer Networking Basics(Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	Students will understand and gain knowledge about Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	PPT A-V	
		Computer Networking Basics(Overview of Traceroute and Ping)	T-1 R-1 R-2 R-4	RW-3 RW-4 AV-2	Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	Students will understand and gain knowledge about Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	PPT A-V	
	Lecture 8	Computer Networking Basics(Subnetting and Routing,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	Students will understand and gain knowledge about Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	PPT A-V	
		Computer Networking Basics(Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP,)	T-1 R-1 R-2	RW-3 RW-4 AV-2	Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	Students will understand and gain knowledge about Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 4	Lecture 8	Computer Networking Basics(Overview of Traceroute and Ping)	T-1 R-1 R-2 R-4	RW-3 RW-4 AV-2	Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	Students will understand and gain knowledge about Subnetting and Routing, Key Protocols: HTTP, SMTP, POP/IMAP, FTP, DNS, DHCP, Overview of Traceroute and Ping	PPT A-V	
Week 5	Lecture 9				Test			
	Lecture 10	Database Management Systems (DBMS) (Introduction to Databases and RDBMS,)	T-1 R-2 R-3 R-4	RW-5 RW-6 AV-3	Introduction to Databases and RDBMS, Basics of Databases and RDBMS, Data Definitions: Tables, Fields, Records,	Students will understand the Fundamentals of DBMS and	PPT	
		Database Management Systems (DBMS)(Basics of Databases and RDBMS,)	T-1 R-2 R-3	RW-5 RW-6 AV-3	Introduction to Databases and RDBMS, Basics of Databases and RDBMS, Data Definitions: Tables, Fields, Records,	Students will understand the Fundamentals of DBMS and	PPT	
		Database Management Systems (DBMS)(Data Definitions: Tables, Fields, Records,)	T-1 R-2 R-3	RW-5 RW-6 AV-3	Introduction to Databases and RDBMS, Basics of Databases and RDBMS, Data Definitions: Tables, Fields, Records,	Students will understand the Fundamentals of DBMS and	PPT	
Week 6	Lecture 11	Database Management Systems (DBMS)(SQL and Data Manipulation,)	T-1 R-2 R-3	RW-5 RW-6 AV-3	SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	Students will learn about SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	PPT A-V	
		Database Management Systems (DBMS)(Database Keys and Data Integrity,)	T-1 R-2 R-3	RW-5 RW-6 AV-3	SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	Students will learn about SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 6	Lecture 11	Database Management Systems (DBMS)(Database Normalization and Transactions,)	T-1 R-2 R-3	RW-5 RW-6 AV-3	SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	Students will learn about SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	PPT A-V	
	Lecture 12	Database Management Systems (DBMS)(SQL and Data Manipulation,)	T-1 R-2 R-3	RW-5 RW-6 AV-3	SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	Students will learn about SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	PPT A-V	
		Database Management Systems (DBMS)(Database Keys and Data Integrity,)	T-1 R-2 R-3	RW-5 RW-6 AV-3	SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	Students will learn about SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	PPT A-V	
		Database Management Systems (DBMS)(Database Normalization and Transactions,)	T-1 R-2 R-3	RW-5 RW-6 AV-3	SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	Students will learn about SQL and Data Manipulation, Database Keys and Data Integrity, Database Normalization and Transactions	PPT A-V	
Week 7	Lecture 13	Database Management Systems (DBMS) (Fundamentals of Normalization,)	T-1 R-2 R-3 R-4	RW-5 RW-6 AV-3	Fundamentals of Normalization, Transaction Management in DBMS	Students will learn and apply the Fundamentals of Normalization, Transaction Management in DBMS.	PPT A-V	
		Database Management Systems (DBMS) (Transaction Management in DBMS)	T-1 R-2 R-3 R-4	RW-5 RW-6 AV-3	Fundamentals of Normalization, Transaction Management in DBMS	Students will learn and apply the Fundamentals of Normalization, Transaction Management in DBMS.	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

		SPILL OVER						
Week 7	Lecture 14				Spill Over			
		MID-TERM						
Week 8	Lecture 15	Fundamentals of Programming Languages (C/C++/Java Interview Questions Overview,)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	C/C++/Java Interview Questions Overview, Variables, Data Types, and Memory, Pointers and Storage, Classes	Student will learn the C/C++/Java Interview Questions Overview, Variables, Data Types, and Memory, Pointers and Storage, Classes	PPT	
		Fundamentals of Programming Languages (Variables, Data Types, and Memory,)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	C/C++/Java Interview Questions Overview, Variables, Data Types, and Memory, Pointers and Storage, Classes	Student will learn the C/C++/Java Interview Questions Overview, Variables, Data Types, and Memory, Pointers and Storage, Classes	PPT	
		Fundamentals of Programming Languages (Pointers and Storage, Classes,)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	C/C++/Java Interview Questions Overview, Variables, Data Types, and Memory, Pointers and Storage, Classes	Student will learn the C/C++/Java Interview Questions Overview, Variables, Data Types, and Memory, Pointers and Storage, Classes	PPT	
	Lecture 16	Fundamentals of Programming Languages (Introduction to Object-Oriented Programming (OOP),)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Introduction to Object-Oriented Programming (OOP), Compiler and Interpreter Basics, Understanding Process Loading and Linking	Students will learn about Introduction to Object-Oriented Programming (OOP), Compiler and Interpreter Basics, Understanding Process Loading and Linking	PPT	
		Fundamentals of Programming Languages (Compiler and Interpreter Basics,)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Introduction to Object-Oriented Programming (OOP), Compiler and Interpreter Basics, Understanding Process Loading and Linking	Students will learn about Introduction to Object-Oriented Programming (OOP), Compiler and Interpreter Basics, Understanding Process Loading and Linking	PPT	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 8	Lecture 16	Fundamentals of Programming Languages (Understanding Process Loading and Linking,)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Introduction to Object-Oriented Programming (OOP), Compiler and Interpreter Basics, Understanding Process Loading and Linking	Students will learn about Introduction to Object-Oriented Programming (OOP), Compiler and Interpreter Basics, Understanding Process Loading and Linking	PPT	
Week 9	Lecture 17	Fundamentals of Programming Languages (Techniques of Parameter Passing and Binding,)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Techniques of Parameter Passing and Binding, Storage Organization and Storage Classes, Advanced OOP Concepts and Data Structures, Abstract Data Types (ADTs),	Students will understand and apply the concepts of Techniques of Parameter Passing and Binding, Storage Organization and Storage Classes, Advanced OOP Concepts and Data Structures, Abstract Data Types (ADTs),	PPT 1-V	
		Fundamentals of Programming Languages (Storage Organization and Storage Classes,)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Techniques of Parameter Passing and Binding, Storage Organization and Storage Classes, Advanced OOP Concepts and Data Structures, Abstract Data Types (ADTs),	Students will understand and apply the concepts of Techniques of Parameter Passing and Binding, Storage Organization and Storage Classes, Advanced OOP Concepts and Data Structures, Abstract Data Types (ADTs),	PPT 1-V	
		Fundamentals of Programming Languages (Advanced OOP Concepts and Data Structures)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Techniques of Parameter Passing and Binding, Storage Organization and Storage Classes, Advanced OOP Concepts and Data Structures, Abstract Data Types (ADTs),	Students will understand and apply the concepts of Techniques of Parameter Passing and Binding, Storage Organization and Storage Classes, Advanced OOP Concepts and Data Structures, Abstract Data Types (ADTs),	PPT 1-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 9	Lecture 17	Fundamentals of Programming Languages (Abstract Data Types (ADTs),)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Techniques of Parameter Passing and Binding, Storage Organization and Storage Classes, Advanced OOP Concepts and Data Structures, Abstract Data Types (ADTs),	Students will understand and apply the concepts of Techniques of Parameter Passing and Binding, Storage Organization and Storage Classes, Advanced OOP Concepts and Data Structures, Abstract Data Types (ADTs),	PPT 1-V	
	Lecture 18	Fundamentals of Programming Languages (Data Structure Principles,)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Data Structure Principles, Advanced Programming Techniques, Memory Handling in OOP Languages	Students will learn and apply Data Structure Principles, Advanced Programming Techniques, Memory Handling in OOP Languages	PPT A-V	
		Fundamentals of Programming Languages (Advanced Programming Techniques,)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Data Structure Principles, Advanced Programming Techniques, Memory Handling in OOP Languages	Students will learn and apply Data Structure Principles, Advanced Programming Techniques, Memory Handling in OOP Languages	PPT A-V	
		Fundamentals of Programming Languages (Memory Handling in OOP Languages)	T-1 R-1 R-2 R-4	RW-7 RW-8 AV-4	Data Structure Principles, Advanced Programming Techniques, Memory Handling in OOP Languages	Students will learn and apply Data Structure Principles, Advanced Programming Techniques, Memory Handling in OOP Languages	PPT A-V	
Week 10	Lecture 19				Test - Code based			
	Lecture 20	Algorithms and Data Structures(Understanding Algorithms and Analysis,)	T-1 R-1 R-2 R-4	RW-9 RW-10 AV-5	Understanding Algorithms and Analysis, Running Time Analysis and Rate of Growth, Asymptotic Notation: Big-O Notation,	Students will learn about Understanding Algorithms and Analysis, Running Time Analysis and Rate of Growth, Asymptotic Notation: Big-O Notation,	PPT	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 10	Lecture 20	Algorithms and Data Structures(Running Time Analysis and Rate of Growth,)	T-1 R-1 R-2 R-4	RW-9 RW-10 AV-5	Understanding Algorithms and Analysis, Running Time Analysis and Rate of Growth, Asymptotic Notation: Big-O Notation,	Students will learn about Understanding Algorithms and Analysis, Running Time Analysis and Rate of Growth, Asymptotic Notation: Big-O Notation,	PPT	
		Algorithms and Data Structures(Asymptotic Notation: Big-O Notation,)	T-1 R-1 R-2 R-4	RW-9 RW-10 AV-5	Understanding Algorithms and Analysis, Running Time Analysis and Rate of Growth, Asymptotic Notation: Big-O Notation,	Students will learn about Understanding Algorithms and Analysis, Running Time Analysis and Rate of Growth, Asymptotic Notation: Big-O Notation,	PPT	
Week 11	Lecture 21	Algorithms and Data Structures(Data Structures and Recursive Algorithms,)	T-1 R-1 R-2 R-4	RW-9 RW-10 AV-5	Data Structures and Recursive Algorithms, Recursion and Backtracking,	Students will understand Data Structures and Recursive Algorithms, Recursion and Backtracking,	PPT	
		Algorithms and Data Structures(Recursion and Backtracking,)	T-1 R-1 R-2 R-4	RW-9 RW-10 AV-5	Data Structures and Recursive Algorithms, Recursion and Backtracking,	Students will understand Data Structures and Recursive Algorithms, Recursion and Backtracking,	PPT	
	Lecture 22	Algorithms and Data Structures(Linked Lists,)	T-1 R-1 R-2 R-4	RW-9 RW-10 AV-5	Linked Lists, Stacks, and Queues, Trees and Binary Search Trees (BSTs)	Students will apply The concepts of Linked Lists, Stacks, and Queues, Trees and Binary Search Trees (BSTs)	PPT A-V	
		Algorithms and Data Structures(Stacks and Queues,)	T-1 R-1 R-2 R-4	RW-9 RW-10 AV-5	Linked Lists, Stacks, and Queues, Trees and Binary Search Trees (BSTs)	Students will apply The concepts of Linked Lists, Stacks, and Queues, Trees and Binary Search Trees (BSTs)	PPT A-V	
		Algorithms and Data Structures(Trees and Binary Search Trees (BSTs))	T-1 R-1 R-2 R-4	RW-9 RW-10 AV-5	Linked Lists, Stacks, and Queues, Trees and Binary Search Trees (BSTs)	Students will apply The concepts of Linked Lists, Stacks, and Queues, Trees and Binary Search Trees (BSTs)	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 12	Lecture 23	Advanced Algorithms and Problem-Solving Techniques(Sorting and Searching Algorithms,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Sorting and Searching Algorithms, Classification and Comparison of Sorting Algorithms, Linear and Non-Linear Searching Techniques,	Students will recall and understand Sorting and Searching Algorithms, Classification and Comparison of Sorting Algorithms, Linear and Non-Linear Searching Techniques,	PPT A-V	
		Advanced Algorithms and Problem-Solving Techniques(Classification and Comparison of Sorting Algorithms,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Sorting and Searching Algorithms, Classification and Comparison of Sorting Algorithms, Linear and Non-Linear Searching Techniques,	Students will recall and understand Sorting and Searching Algorithms, Classification and Comparison of Sorting Algorithms, Linear and Non-Linear Searching Techniques,	PPT A-V	
		Advanced Algorithms and Problem-Solving Techniques(Linear and Non-Linear Searching Techniques,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Sorting and Searching Algorithms, Classification and Comparison of Sorting Algorithms, Linear and Non-Linear Searching Techniques,	Students will recall and understand Sorting and Searching Algorithms, Classification and Comparison of Sorting Algorithms, Linear and Non-Linear Searching Techniques,	PPT A-V	
	Lecture 24	Advanced Algorithms and Problem-Solving Techniques(Hashing and Hash Table Implementation,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	Students will understand Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 12	Lecture 24	Advanced Algorithms and Problem-Solving Techniques(Graph Algorithms and Design Strategies,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	Students will understand Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	PPT A-V	
		Advanced Algorithms and Problem-Solving Techniques(Graph Representation and Traversals,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	Students will understand Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	PPT A-V	
		Advanced Algorithms and Problem-Solving Techniques(Shortest Path Algorithms,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	Students will understand Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	PPT A-V	
Week 13	Lecture 25	Advanced Algorithms and Problem-Solving Techniques(Hashing and Hash Table Implementation,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	Students will understand Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 13	Lecture 25	Advanced Algorithms and Problem-Solving Techniques(Graph Algorithms and Design Strategies,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	Students will understand Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	PPT A-V	
		Advanced Algorithms and Problem-Solving Techniques(Graph Representation and Traversals,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	Students will understand Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	PPT A-V	
		Advanced Algorithms and Problem-Solving Techniques(Shortest Path Algorithms,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	Students will understand Hashing and Hash Table Implementation, Graph Algorithms and Design Strategies, Graph Representation and Traversals, Shortest Path Algorithms	PPT A-V	
	Lecture 26	Advanced Algorithms and Problem-Solving Techniques(Introduction to Greedy,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Introduction to Greedy, Divide and Conquer, and Dynamic Programming Strategies	Students will learn about Introduction to Greedy, Divide and Conquer, and Dynamic Programming Strategies	PPT A-V	
		Advanced Algorithms and Problem-Solving Techniques(Divide and Conquer,)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Introduction to Greedy, Divide and Conquer, and Dynamic Programming Strategies	Students will learn about Introduction to Greedy, Divide and Conquer, and Dynamic Programming Strategies	PPT A-V	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 13	Lecture 26	Advanced Algorithms and Problem-Solving Techniques(Dynamic Programming Strategies)	T-1 R-1 R-2 R-4	RW-11 RW-12 AV-6	Introduction to Greedy, Divide and Conquer, and Dynamic Programming Strategies	Students will learn about Introduction to Greedy, Divide and Conquer, and Dynamic Programming Strategies	PPT A-V	
Week 14	Lecture 27				Interview			
		SPILL OVER						
Week 14	Lecture 28				Spill Over			
Week 15	Lecture 29				Spill Over			
	Lecture 30				Spill Over			

Scheme for CA:

CA Category of this Course Code is:A0203 (2 best out of 3)

Component	Weightage (%)	Mapped CO(s)
Interview	50	CO1, CO2, CO3, CO4, CO5, CO6
Test - Code based	50	CO3, CO4
Test	50	CO1, CO2

Details of Academic Task(s)

Academic Task	Objective	Detail of Academic Task	Nature of Academic Task (group/individuals)	Academic Task Mode	Marks	Allottment / submission Week
Interview	To test answering skills and abilities of students in interview	Technical Questions based on Service based companies(Proficiency in Technical Skills,Effective use of Technical Terminologies, Engagement and Confidence and Problem Solving Approach)	Individual	Online	30	4 / 13
Test	To test the knowledge of the students	30 MCQ based on Operating System(Each Question one mark)	Individual	Online	30	4 / 6
Test - Code based	To test implementation skills of the students based on SQL	Based on Database Management System(2 Question ,Each Carries 15 marks)	Individual	Online	30	9 / 11

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

List of suggested topics for term paper[at least 15] (Student to spend about 15 hrs on any one specified term paper)

Sr. No.	Topic
1	OS DSA

Detailed Plan For Practicals

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	List of Practicals	1. Introduction to Linux Commands	RW-1 RW-2 AV-1	Basic Linux Commands
Practical 2	List of Practicals	2. Shell Programming	RW-1 RW-2 AV-1	Shell Programming
Practical 3	List of Practicals	3. System Calls (File / Directory/ Process)	RW-1 RW-2 AV-1	System Calls
	List of Practicals	4. Multi Thread Process using Pthread Library	RW-1 RW-2 AV-1	System Calls
Practical 4	List of Practicals	4. Multi Thread Process using Pthread Library	RW-1 RW-2 AV-1	System Calls
	List of Practicals	3. System Calls (File / Directory/ Process)	RW-1 RW-2 AV-1	System Calls
Practical 5	List of Practicals	5. SQL Commands (DDL/DML/ TCL)	RW-5 RW-6 AV-3	SQL/ PL-SQL
	List of Practicals	6. PL/SQL Triggers, Procedures, Functions	RW-5 RW-6 AV-3	SQL/ PL-SQL

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Practical 6	List of Practicals	6. PL/SQL Triggers, Procedures, Functions	RW-5 RW-6 AV-3	SQL/ PL-SQL
	List of Practicals	5. SQL Commands (DDL/DML/ TCL)	RW-5 RW-6 AV-3	SQL/ PL-SQL
Practical 7	List of Practicals	7. Subnetting	RW-3 RW-4 AV-2	Sub Netting
Practical 8	List of Practicals	8. Arrays and Linked List	RW-9 RW-10 RW-11 RW-12 AV-4 AV-5	Problem Solving
	List of Practicals	10. Trees and Binary Search Trees	RW-9 RW-10 RW-11 RW-12 AV-4 AV-5	Problem Solving
	List of Practicals	9. Stacks and Queues	RW-9 RW-10 RW-11 RW-12 AV-4 AV-5	Problem Solving
Practical 9	List of Practicals	9. Stacks and Queues	RW-9 RW-10 RW-11 RW-12 AV-4 AV-5	Problem Solving
	List of Practicals	10. Trees and Binary Search Trees	RW-9 RW-10 RW-11 RW-12 AV-4 AV-5	Problem Solving

Practical 9	List of Practicals	8. Arrays and Linked List	RW-9 RW-10 RW-11 RW-12 AV-4 AV-5	Problem Solving
Practical 10	Test - Code based			
	SPILL OVER			
Practical 11	Spill Over			