

GURU NANAK DEV ENGINEERING COLLEGE, LUDHIANA

Department of Computer Science & Engineering

Mappings of Course Outcomes with Program Outcomes for Scheme-2024 B.Tech (CSE)

Sem	Course Code	Course Name	CO #	CO (Course Outcomes)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
3rd	CCS101	Object Oriented Programming	CO1	Demonstrate programming skills in writing, compiling and debugging C++ programs	3		1	2	2								1
			CO2	Use class and object to implement object-oriented approach.	3		1	2	3								2
			CO3	Apply inheritance and polymorphism to implement object-oriented programs.	3		1	2	2								1
			CO4	Analyse the relevance of dynamic memory management for effective memory utilization.		1		2	3							1	
			CO5	Make use of exception handling and file handling in program development.	3		1	2	2								1
			CO6	Develop solution for programming problems using object-oriented principles.	3	3	2	3						2		2	

3rd	CCS102	Data Structures	CO1	Apply Arrays and Linked Lists to solve computational problems.	3		2	2	2							2
			CO2	Implement stack and queue data structures to solve programming problems.	3		2	2	2							2
			CO3	Apply appropriate indexing and searching techniques to optimize data storage and retrieval.	3		3	2	2							2
			CO4	Analyze non-linear data structures to perform efficient storage, retrieval, and traversal operations.		1		2	2						3	
			CO5	Analyze time and space complexity of different sorting algorithms.		1		1	2						1	
			CO6	Identify the appropriate data structure to provide solution with reduced space and time complexity.	3	2	3	2							3	

3rd	ESCS-101	Digital Electronics	CO1	Apply the structure of number systems in digital design.	3		2	3	2							2
			CO2	Minimize the Boolean expressions in SOP and POS form using K-maps.	3		2	2	1							2
			CO3	Apply knowledge of basic characteristics of logic families to design digital circuits.	3		2	3	2							2
			CO4	Demonstrate the basic knowledge of behavioral objects of VHDL in programming.		2		2								2
			CO5	Implement combinational logic circuits using Boolean algebra and logic gates and simulate them using VHDL.				2	2							2
			CO6	Analyze Synchronous and Asynchronous sequential circuits using Flip Flops, registers and Counters and simulate them using VHDL.		2		2	3						2	

3rd	CCS103	Computer Architecture	CO1	Understand the Data representation, Register Transfer and micro-operations in computer system.		2		2									2
			CO2	Illustrate the CPU architecture and I/O interfacing for different modes of transfer.		2		3									2
			CO3	Analyze memory hierarchy in computer system for efficient memory management.		2		2	2							2	
			CO4	Understand the organization of components of a computer system and their interconnectivity.		3		2									1
			CO5	Develop assembly language programs using 8085 instruction set to perform fundamental operations.	3		2	3	2								1
			CO6	Interface peripheral devices with microprocessors using 8255, 8259, and 8237.	3		2	3	2								2

3rd	SMCS101	Seminar and Technical Report Writing For Engineers	CO1	To install BibTeX and PDFLaTeX on Windows and Linux operating systems.	3		1	2	2								1
			CO2	Utilize LaTeX tools for document preparation and compilation.	3		1	2	2								2
			CO3	Compare LaTeX and Markdown formats using Pandoc for documentation purposes.		3		2	2					2			1
			CO4	Present technical content effectively through oral presentations.		2		2	2				3	3	3	1	
			CO5	Use LaTeX effectively for technical document writing.	3		1	2	2								

4th	CCS105	Operating System	CO1	Understand the components of operating systems and design issues associated with it.		1		2								2
			CO2	Apply the knowledge of various process management concepts for process synchronization.	1		2	2	1							2
			CO3	Illustrate the concept of scheduling algorithms to work in multitasking environment.	1		2	1	2							2
			CO4	Analyze the algorithms for deadlock management, file management and memory management.		1		1	2						3	
			CO5	Evaluate file system structures and implement file handling, directory structures, and disk scheduling algorithms.				1	2						3	

4th	CCS106	Computer Networks	CO1	Understand the key concepts of data communication to real-world networking scenarios.		1		2		3					2		2
			CO2	Apply the concepts of analog and digital signals for transmission of data using efficient bandwidth utilization.	2		2	2	3	2					2		1
			CO3	Evaluate network performance metrics and algorithms for selecting efficient communication paths.				2	2						2	2	
			CO4	Analyze the design concepts for process to process delivery in end-to-end communication.		2		3	2						2	3	
			CO5	Assess the functionalities of various network layers and protocols to understand their contribution in computer networks		2		2	2		3		2		2		2

4th	CCS107	Discrete Mathematics	CO1	Apply the principles of sets, relations, and functions to solve mathematical problems.	2		1	1	2							1
			CO2	Construct formal proofs to validate logical arguments using mathematical reasoning.	3	2	1	2							1	
			CO3	Evaluate combinatorial problems using appropriate mathematical methods and techniques.				2	2						1	
			CO4	Apply number theory concepts to solve computational problems in computer science.	3		1	2	2							1
			CO5	Prove elementary properties of algebraic structures and apply them in the analysis and interpretation of data to draw valid conclusions.		2		2	3						1	
			CO6	Make use of appropriate mathematical models to assess real-world problems.	3		1	2	2							2

4th	CCS108	Artificial Intelligence	CO1	Understand the foundational principles and scope of Artificial Intelligence and its role in building intelligent systems.		3		2								1
			CO2	Examine problems that can be solved using AI techniques such as search, logic, learning, and decision-making.		3		3	3						2	
			CO3	Apply AI methods and models, including classical algorithms, machine learning, and neural networks to solve real-world problems.	3		1	2	2							2
			CO4	Demonstrate the ability to use modern AI tools and platforms to develop intelligent systems and evaluate their performance.				2	3						1	
			CO5	Analyze the capabilities and limitations of AI technologies, including deep learning, generative models, and large language models.		2		2	3						1	
			CO6	Exhibit awareness of ethical, societal, and practical considerations in the design and deployment of AI systems.	2	1	2	1							1	

4th	LCCS109	Data Analytics Tools	CO1	Apply data preparation techniques in Excel and Python to clean, filter, and merge structured datasets for analysis.	3		1	2	3							2
			CO2	Create charts and dashboards using Matplotlib and Power BI/Tableau to display the changes and relationships within datasets.	3			2	2						2	
			CO3	Perform statistical inference methods to validate hypotheses using real-world data samples.		2		2	2						2	
			CO4	Design interactive dashboards in Power BI/Tableau to present key performance indicators and filtering options for data exploration.	3			2	2						2	
			CO5	Integrate Excel, Python, and data visualization tools in a project to analyze a given dataset by preparing data, calculating performance metrics, and presenting insights for decision-making.	3	2	1	1	2					2	2	3

4th	MCCS- 101	Environmental Science and Sustainability	CO1	To understand problems of environmental pollution, its impact on human and ecosystem.		1		2								2
			CO2	Gain knowledge on natural processes and resources that sustain life and govern economy.		2		2								2
			CO3	Analyze the role of conservation of biodiversity and its importance		2		1	2						2	
			CO4	To make use of green computing fundamentals for sustainable solutions.	1		1	1	2							3
			CO5	To analyze the e-waste management for sustainable development.		2		1	2						3	
			CO6	Adopt sustainability as a practice in life and society.		2		2								2