Department Of Computer Science and Applications
Master of Computer Applications
AY: 2025-26

S#	Cat	Course Code - Course Title	CO	CO Description
1	PCC	25CA5101- OPERATING SYSTEMS	CO1	Understand the functional roles of modern OS in software and cloud systems.
	PCC		CO2	Apply process and task management tools to enhance software workflows.
	PCC		CO3	Use file systems, access control, and automation in cross-platform environments.
	PCC		CO4	Integrate OS-level tools and practices in cloud-native and containerized environments.
	PCC		CO5	Implement and evaluate processes, file systems, storage, virtualization technologies and optimize the infrastructure in modern IT environments.
2	PCC	25CA5102- PROBLEM SOLVING THROUGH PROGRAMMING	CO1	Write structured programs using control structures and syntax rules
	PCC		CO2	Solve problems using modular programming, string, and list operations
	PCC		CO3	Use data structures and file operations in real-world computing scenarios.
	PCC		CO4	Apply logical thinking to solve computing problems through code.
	PCC		CO5	Implement python programming concepts to solve problems on list, files, tuples, dictionaries
	PCC		CO6	Develop solutions for real world problems using python.
3	PCC	25CA5103- COMPUTER NETWORKS & SECURITY	CO1	Understand and use core networking concepts and tools in IT environments.
	PCC		CO2	Configure, secure, and troubleshoot networks using system tools.
	PCC		CO3	Analyze and manage enterprise-grade cloud and virtual network solutions.
	PCC		CO4	Apply essential security practices and tools to protect networks and data.
4	PCC	25CA5104- ARTIFICIAL INTELLIGENCE	CO1	Understand basic AI paradigms and apply search-based problem solving.
	PCC		CO2	Apply knowledge representation for building rule-based intelligent systems.
	PCC		CO3	Use AI libraries and cloud APIs to build intelligent applications.
	PCC		CO4	Analyze and apply AI solutions to automate business and IT workflows.

				CO1	Apply foundational OOP concepts to structure Java applications
	PCC			CO2	Use Java collections effectively for real-world data manipulation.
	PCC			CO3	Implement functional style programming using lambdas and Stream API
5	PCC	25CA5105- OBJECT ORIENTED PROGRAMMING		CO4	Build multithreaded and event-driven interfaces using Java.
	PCC			CO5	Apply OOP, collections, functional programming, and multithreading in Java to build efficient and modular real-world applications.
	PCC			CO6	Design and implement Java-based applications by applying OOP principles, data structures, functional programming, and multithreading to solve real-world problems with hands-on coding skills.
	PCC			CO1	Understand and document software requirements using standard SDLC approaches
	PCC			CO2	Apply object-oriented and architectural design principles using UML.
6	PCC	25CA5206- SOFTWARE ENGINEERING		CO3	Practice agile software development and DevOps fundamentals.
	PCC			CO4	Evaluate software quality and estimate project effort using appropriate metrics
	PCC			CO1	Understand cloud models, service types, and the enabling role of virtualization
	PCC			CO2	Compare major cloud platforms and identify core service offerings.
7	PCC	25CA5207- CLOUD INFRASTRUCTURE & SERVICES		CO3	Use Infrastructure as Code to automate and manage cloud infrastructure
	PCC			CO4	Implement governance and security best practices in cloud environments.
	PCC			CO5	Analyze and apply cloud environments and cloud security governance practices.
	PCC			CO1	Apply linear data structures for algorithmic problem solving.
	PCC			CO2	Implement tree and graph structures for solving hierarchical and networked problems.
	PCC			CO3	Analyze and apply searching and sorting algorithms for structured datasets.
8	PCC	25CA5208- DATA STRUCTURES		CO4	Analyze and build optimized solutions using combined data structure techniques.
	PCC			CO5	Implement and evaluate linear and non-linear data structures (such as arrays, linked lists, stacks, queues, trees, and graphs) using a programming language.
	PCC			CO6	Develop and test real-time applications using appropriate data structures and algorithms to solve structured and unstructured problems.

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			CO1	Design relational databases using ER modeling and normalization techniques.
	PCC		CO2	Write efficient SQL queries and apply transaction handling concepts.
9	PCC	25CA5209- DATABASE MANAGEMENT SYSTEMS	CO3	Explain the internal architecture of a DBMS and apply query execution principles.
	PCC		CO4	Use NoSQL databases and integrate databases into software applications.
	PCC		CO5	Evaluate various query processing methods and justify their effectiveness for optimizing database performance.
10	PCC	25CA6110- DATA SCIENCE & BIG DATA ANALYTICS	CO1	Perform data collection, cleaning, and exploration using Python tools.
	PCC		CO2	Build visual analytics and dashboards to communicate data insights.
	PCC		CO3	Use big data tools to process and analyze large-scale datasets.
	PCC		CO4	Construct end-to-end data science workflows and deploy models.
	PCC		CO5	Design and implement end-to-end ETL pipelines using Pandas and Scikit-learn, and deploy data models using RESTful APIs and cloud platforms
11	PCC	25CA6111- DESIGN & ANALYSIS OF ALGORITHMS	CO1	Apply linear data structures for algorithmic problem solving.
	PCC		CO2	Implement tree and graph structures for solving hierarchical and networked problems.
	PCC		CO3	Analyze and apply searching and sorting algorithms for structured datasets.
	PCC		CO4	Analyze and build optimized solutions using combined data structure techniques.
	PCC		CO5	Develop and implement algorithms using modern programming tools to solve real-time problems in lab settings
	PCC		CO6	Demonstrate problem-solving and debugging skills by applying algorithmic techniques in mini-projects or case studies
12	PCC	25CA6112 - CLOUD DEVSECOPS	CO1	Understand DevOps culture and cloud infrastructure automation techniques
	PCC		CO2	Design and implement end-to-end CI/CD pipelines using DevOps tools.
	PCC		CO3	Apply security practices across the DevOps lifecycle using automation tools.
	PCC		CO4	Integrate observability tools and reliability engineering in cloud-native environments.
	PCC		CO5	Analyze and apply cloud environments and cloud security governance practices.
13	PCC	25CA6113 - AI TOOLS FOR IT MANAGERS	CO1	Choose AI categories and identify strategic areas for AI adoption in IT.
	PCC		CO2	Use low-code AI tools for automation and process enhancement in business contexts.

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14	PEC	25CA52A1-MACHINE LEARNING	CO1	Understand ML types, basic workflows, and the learning process.
	PEC		CO2	Apply key supervised learning models using standard libraries.
	PEC		CO3	Use unsupervised techniques for pattern discovery in datasets.
	PEC		CO4	Tune and interpret ML models and prepare them for basic deployment
15	PEC	25CA52C1-INTRODUCTION TO CYBER SECURITY & ETHICAL HACKING	CO1	Understand threat models and basic risk principles.
	PEC		CO2	Apply ethical reconnaissance and exploitation simulations.
	PEC		CO3	Use scanning and enumeration tools to assess weak points.
	PEC		CO4	Identify modern vectors in wireless and cloud platforms using simulation tools.
16	PEC	25CA61A2–DEEP LEARNING	CO1	Explain and implement basic neural networks with appropriate activation and loss functions.
	PEC		CO2	Train and optimize deep neural networks using modern frameworks.
	PEC		CO3	Apply CNNs and RNNs for vision and sequence-related problems.
	PEC		CO4	Deploy deep learning models and apply them to enterprise IT usecases.
	PEC		CO5	Analyze and compare CNNs, RNNs, auto encoders, GANs to select the best model for applications.
17	PEC	25CA61C2-PENETRATION TESTING & VULNERABILITY ASSESSMENT	CO1	Conduct reconnaissance and vulnerability scanning using standard tools.
	PEC		CO2	Simulate system/network exploits and identify privilege escalation paths.
	PEC		CO3	Exploit and mitigate web app vulnerabilities using industry tools.
	PEC		CO4	Document security assessments and recommend appropriate remediations.
	PEC		CO5	Implement end-to-end penetration testing using lifecycle, reconnaissance and exploitation techniques.
18	PEC	25CA61A3-NATURAL LANGUAGE PROCESSING & LARGE LANGUAGE MODELS	CO1	Preprocess and structure textual data using foundational NLP techniques.
	PEC		CO2	Build classical NLP models using word embeddings and supervised learning.
	PEC		CO3	Apply transformer-based LLMs for diverse NLP tasks using pre-trained models.
	PEC		CO4	Build enterprise NLP applications using LLMs with awareness of ethical concerns.
19	PEC	25CA61C3-SECURE SOFTWARE ENGINEERING	CO1	Understand the integration of security throughout the software development lifecycle.
	PEC		CO2	Apply secure coding techniques to prevent common software vulnerabilities.
	PEC		CO3	Perform secure software testing using static and dynamic analysis tools.
	PEC		CO4	Design secure systems and ensure compliance with security standards.
20	PEC	25CA62A4-GENERATIVE AI	CO1	Understand the mathematical and conceptual foundations of generative models.
	PEC		CO2	Design and train GAN-based architectures for image and content generation.
	PEC		CO3	Implement LLMs for natural language generation tasks using modern frameworks.
	PEC		CO4	Build business-relevant generative AI applications while addressing ethical constraints.
	PEC		CO5	Develop and evaluate generative AI applications using the Python programming language.

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21	PEC	25CA62C4-DIGITAL& CYBER FORENSICS	CO1	Understand the fundamentals of digital forensics and the legal framework of cybercrime.
	PEC		CO2	Perform analysis of file systems and operating system artifacts using forensic tools.
	PEC		CO3	Analyze digital evidence from network traffic and mobile devices.
	PEC		CO4	Handle cyber incidents and document forensic findings according to professional standards.
	PEC		CO5	Implement and evaluate forensic investigation procedures through hands-on simulations, ensuring proper documentation, chain of custody, and response to security incidents.
22	PEC	25CA62A5-MLOPs	CO1	Understand the principles and workflow components of MLOps pipelines.
	PEC		CO2	Package and deploy machine learning models using industry-standard tools.
	PEC		CO3	Monitor deployed models and apply strategies for drift management and retraining.
	PEC		CO4	Automate model lifecycle and manage cloud-native MLOps pipelines effectively.
23	PEC	25CA62C5-MALWARE ANALYSIS	CO1	Identify different types of malware and describe their roles and effects within the Cybersecurity landscape.
	PEC		CO2	Apply static analysis techniques to extract actionable intelligence from malware binaries.
	PEC		CO3	Analyze the behavior of malware through runtime execution and interactions with system components.
	PEC		CO4	Analyze malware using reverse engineering and develop defensive signatures and detection rules.
24	BSC	25MT5103-MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE	CO1	Apply propositional and predicate logic to represent and analyze logical arguments using inference rules and equivalence laws.
	BSC		CO2	Analyze and perform set operations, Venn diagrams, counting principles including permutations, combinations, and pigeonhole principle.
	BSC		CO3	Apply number theory concepts such as divisibility, modular arithmetic, Euler's and Fermat's theorems in solving computational problems.
	BSC		CO4	Analyze the structure and properties of groups and rings and demonstrate their application in cryptography and block chain.

25	AUC	25UC0032- PROFESSIONAL ETHICS & COMMUNICATION SKILLS	CO1	Demonstrate effective oral, written, digital, and interpersonal communication skills for academic and professional contexts.
	AUC		CO2	Apply ethical principles, workplace etiquette, and teamwork values for professional decision-making and responsible conduct.
26	PRI	25IE6101- TECHNICAL INTERNSHIP	CO1	Set personalized learning goals, acquire technical expertise, and apply collaborative skills in a professional IT environment
	PRI		CO2	Document and present technical contributions through a professional digital portfolio, while reflecting on personal and professional growth achieved during the internship.
27	PRI	25IE5201- ESSENTIALS OF RESEARCH DESIGN	CO1	Analyze existing research to identify a focused and answerable research question or develop a well-defined hypothesis.
	PRI		CO2	Evaluate different research designs based on their strengths and weaknesses in relation to the chosen research question and data needs.
	PRI		CO3	Apply appropriate data collection methods considering the chosen research design and data characteristics..
	PRI		CO4	Analyze and interpret data using relevant data analysis methods to address the research question.
28	PRI	25IE6203- PROJECT/ INTERNSHIP	CO1	Organize literature search to review current knowledge and developments in the chosen technical area.
	PRI		CO2	Analyze detailed technical work in the chosen area using one or more of theoretical studies computer simulations.
	PRI		CO3	Evaluate progress reports or maintain a professional journal to establish work completed, and to schedule additional work within the time frame specified for the project.
29	SDC	25SDMC01 - FRONT END DEVELOPMENT FRAMEWORKS	CO1	Design static and responsive web interfaces using HTML, CSS, and JavaScript.
	SDC		CO2	Develop dynamic web interactions using JavaScript and DOM programming.
	SDC		CO3	Build interactive UI components using React framework.
	SDC		CO4	Implement routing, styling, and state handling for frontend web apps.
	SDC		CO5	Design Dynamic Web Pages by using HTML, CSS, JS, PHP
30	SDC	25SDMC02- FULL STACK APPLICATION DEVELOPMENT	CO1	Build scalable client-side applications using advanced React concepts.
	SDC		CO2	Develop secure server-side APIs and services using Node.js and Express.
	SDC		CO3	Build Restful backends using Java Spring Boot and relational databases.
	SDC		CO4	Design and integrate micro services architecture for scalable enterprise applications.
	SDC		CO5	Design and build real-time full stack applications by integrating frontend and backend technologies to solve real-world problems.

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	SDC	25SDMC03– WEB 3 DEVELOPMENT USING BLOCKCHAIN	CO1	Understand the principles of blockchain, decentralization, and Web3 ecosystems.
	SDC		CO2	Write and deploy secure smart contracts on Ethereum using Solidity.
31	SDC		CO3	Develop and integrate full-stack decentralized applications (dApps) using Web3 tools.
	SDC		CO4	Apply secure development practices and explore key components in the Web3 ecosystem.
	SDC		CO5	Build scalable Web3 solutions incorporating decentralized storage, oracles, and cross-chain interoperability.
32	AUC	25CC1101 – CODING PLATFORM INTERFACE	CO1	Apply fundamental problem-solving techniques to solve computational problems on online coding platforms, thereby enhancing logic building ability especially for programmers who are new to programming.
	AUC		CO2	Analyze and implement advanced algorithmic to design efficient solutions for optimization, sequence, string, and subset problems.

Professor I/C Academics

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