DEPARTMENT OF COMPUTER APPLICATIONS
Course Outcomes and Mapping of CO-PO, AY: 2023-24

Subject Code: KCA 101		
Subject Name: Fundamental of Computers & Emerging Technologies		
CO Statement		BL (1,2,3,4,5,6)	KC (F,C,P,M)

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Develop the basic knowledge of computer components and algorithms to solve problems using programming concepts.	Apply	C,P
CO2	Demonstrate the features and types of operating system and computer networks.	Understand	C
CO3	Illustrate the basic services of Internet and applications of Internet of Things.	Understand	C
CO4	Examine the features of Blockchain, Cryptocurrency and benefits of cloud computing.	Understand	C
CO5	Discuss the emerging trends and technologies in the field of Information Technology.	Understand	C

Subject Code: KCA102		
Subject Name: Problem Solving using C		

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Solve basic problems with the help of flowcharts and algorithms.	Apply	C,P
CO2	Write 'C' programs that incorporate use of variables, operators, and expressions along with data types	Apply	F, C, P
CO3	Implement programs using the control statements, functions, arrays, and strings.	Apply	C,P
CO4	Write programs using the advanced concepts like pointers, structures, union, and enumerated data types.	Apply	C,P
CO5	Apply file I/ O operations on Binary and Text Files	Apply	C,P

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Course Outcomes and Mapping of CO-PO, AY: 2023-24

Subject Code: KCA 103
Subject Name: Principles of Management & Communication

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Describe primary features, processes and principles of management.	Apply	C
CO2	Explain the functions of management in terms of planning, organizing and decision making.	Apply	C
CO3	Illustrate key factors of leadership skill in directing and controlling business resources and processes.	Apply	C
CO4	Exhibit adequate verbal and non-verbal communication skills at workplace.	Apply	F,C
CO5	Demonstrate effective discussion, presentation and writing skills for various tasks and events like meeting, drafting of letter, proposal and report and their presentation etc.	Apply	C,P

Subject Code: KCA-104
Subject Name: Discrete Mathematics

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Examine the mathematical and logical notation for basic discrete structures such as Sets, Relations and Functions	Apply	C,P
CO2	Apply mathematical arguments using logical connectives and quantifiers to check the validity of an argument.	Apply	C,P
CO3	Prove properties of Algebraic Structures like Groups, Rings and Fields	Apply	C,P
CO4	Solve recurrences relations and generating functions using mathematical logics.	Apply	C,P
CO5	Illustrate the concept of combinatorics to solve basic problems in discrete mathematics	Analyse	C,P

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Subject Code: KCA-105
Subject Name: Computer Organization and Architecture

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Determine the functional units of digital system and operations performed by arithmetic and logical unit.	Apply	C,P
CO2	Demonstrate the various processor organisations with different addressing modes.	Apply	C,P
CO3	Examine the organizations of control unit along with Instruction execution stages and pipeline concept.	Apply	C,P
CO4	Analyse the different types of memories and its organization.	Analyse	C,P
CO5	Illustrate the modes of communication between IO devices and CPU.	Apply	C,P

Subject Code: KCA151
Subject Name: Problem Solving Using C

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Demonstrate Integrated Development Environment (IDE) for compilation, debugging and execution of C program.	Apply	C,P
CO2	Write programs using variables, operators, and expressions along with data types.	Apply	C,P
CO3	Implement programs for decision control structures, loops, and arrays.	Apply	C,P
CO4	Implement concepts of structure, pointer and user defined function.	Apply	C,P
CO5	Write programs using graphics and file handling operations.	Apply	C,P

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Course Outcomes and Mapping of CO-PO, AY: 2023-24

Subject Code: KCA-152
Subject Name: Computer Organization & Architecture Lab

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Examine the output of the basic logic gates for different combinations of input.	Apply	C, P
CO2	Demonstrate various combinational circuits for binary arithmetic operations and code converter	Apply	C, P
CO3	Illustrate combinational circuits and sequential circuits such as encoders/decoders, multiplexers/de-multiplexers, and flip-flops	Apply	C, P
CO4	Implement 2-bit Arithmetic Logic Unit using logic gates and multiplexers	Apply	C, P

Theory of Automata & Formal Languages (KCA-201)

CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Construct DFA, NFA with their minimization and conversion.	BL5	F,C
CO2	Implement regular expressions with closure and decision properties.	BL3	F,C,P
CO3	Represent the Context Free Languages grammar and its normal forms.	BL3	F,C
CO4	Design the PDA with deterministic and Nondeterministic properties	BL5	F,C,P
CO5	Construct the Universal Turing machine.	BL5	C,P,M

Object Oriented Programming (KCA-202)

CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Implement the basic Programming concepts using Java.	3	C,P
CO2	Analyse OOP concepts like Inheritance, Polymorphism, Abstraction and Encapsulation, etc. using Java	4	C,P
CO3	Implement exception handling and file handling in Java	3	C,P
CO4	Apply the concepts of multithreading and generic programming in Java	3	C,P
CO5	Design GUI applications using AWT and Swing in Java	5	C,P

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Operating Systems (KCA-203)

CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	The basics of computer system and overview of operating system along with its functions.	2	F,C
CO2	The processes, their states, threads, Multicore and Multithreading	2	F,C,P
CO3	The CPU scheduling algorithms, Inter process communications, process synchronization and deadlocks.	3	F,C,P
CO4	Various memory management techniques with case study on Windows and Linux.	3	F,C,P
CO5	Various I/O management and file system.	4	F,C,P

Database Management Systems (KCA-204)

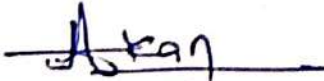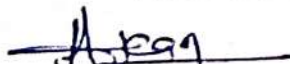| CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Understand overall structure of DBMS, construct ER Models for efficient Database Design	3	F,C,P
CO2	Understand basic concepts of relational model and formulate solutions to a query problem using SQL commands, relational algebra, tuple calculus and domain calculus	3	C,P
CO3	Explain the need of Normalization and normalize a given relation to the desired normal form	4	C,P
CO4	Describe need of transaction processing and recovery mechanism from transaction failures	3	C,P
CO5	Understand various concurrency control techniques and able to apply concurrency control protocols on transactions.	3	C,P

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DA&AOA (KCA-205)

CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Explain Information System in the nature & inherent difficulties in the security.	2	C
CO2	Describe various threats, attacks, and measures to counter them with vulnerability assessment in an organization.	2	C
CO3	Use knowledge and skills for secure application development, security maintenance and understand threats to E-commerce.	3	C,P
CO4	Explain Security policies for email, corporate, www etc.	3	C
CO5	Understand the various aspects of Cyber Crime laws in India and the importance of IPR with respect to software.	3	C

Object Oriented Programming Lab (KCA-251)

CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO-1	Write and execute programs in a Java programming environment.	BL3	C,P
CO-2	Write and execute Object Oriented Programs using Java programming	BL4	C,P
CO-3	Write robust file handling and Object-Oriented Programs with excepting handling approach using Java programming.	BL3	C,P
CO-4	Write Object Oriented Programs with multi-threading and generic programming approach using Java programming.	BL3	C,P
CO-5	Design GUI application with AWT and Swing using Java programming	BL5	C,P

DBMS Lab (KCA-252)

CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Able to design ER models using Case Tools	3	C,P
CO2	Write SQL Commands to query a database	3	C,P
CO3	Write PL/ SQL Programs for implementing stored procedures, stored functions, cursors, triggers and packages	3	C,P

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Data Structures & Analysis of Algorithms Lab (KCA-253)

CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Write and execute programs to implement various searching and sorting algorithms.	3	C,P
CO2	Write and execute programs to implement various operations on two- dimensional arrays.	3	C,P
CO3	Implement various operations of Stacks and Queues using both arrays and linked lists data structures.	3	C,P
CO4	Implement graph algorithm to solve the problem of minimum spanning tree	3	C,P

Cyber Security (KCA-01)

CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Explain Information System in the nature & inherent difficulties in the security.	2	C
CO2	Describe various threats, attacks, and measures to counter them with vulnerability assessment in an organization.	2	C
CO3	Use knowledge and skills for secure application development, security maintenance and understand threats to E-commerce.	3	C,P
CO4	Explain Security policies for email, corporate, www etc.	3	C
CO5	Understand the various aspects of Cyber Crime laws in India and the importance of IPR with respect to software.	3	C

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DEPARTMENT OF COMPUTER APPLICATIONS
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Subject Code: KCA 301
Subject Name: Artificial Intelligence
Tagging COs with BLs & KCs

CO	CO Statement	Bloom Level	Knowledge Category
CO-1	Describe knowledge of the building blocks of AI as presented in terms of intelligent agents.	BL2	F,C
CO-2	Sketch the problem as state space graph with various searching techniques to solve a specific problem.	BL3	F,C,P
CO-3	Demonstrate knowledge and its representation in real world with logical reasoning steps.	BL3	F,C,P
CO-4	Construct AI algorithm for real world problems with different machine learning techniques.	BL3	F,C,P
CO-5	Illustrate knowledge about state-of-the-art algorithms used in pattern recognition area.	BL3	F,C,P

Subject Code: KCA302
Subject Name: Software Engineering
Tagging of COs with BLs and KCs

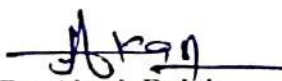| CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Describe Software Engineering Concepts and SDLC models.	2	F,C,P
CO2	Prepare Software Requirement Specification (SRS) with Modelling tools and Quality standards.	3	F,C,P
CO3	Analyse design concepts to software development with software metrics methods.	4	F,C,P
CO4	Categorize software testing techniques and its implementation.	4	F,C,P
CO5	Contrast Software project management activities with its parameters such as Cost, Efforts, Schedule/ Duration.	4	F,C,P

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Subject Code: KCA303
Subject Name: Computer Network
Tagging of COs with BLs and KCs

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Describe communication models TCP/IP, ISO-OSI model, network topologies along with communicating devices and connecting media.	Understand	F,C
CO2	Apply knowledge of error detection, correction and learn concepts of flow control along with error control.	Apply	C,P
CO3	Apply IP addressing techniques, subnetting along with network routing protocols and algorithms.	Apply	C,P
CO4	Explore transport layer protocols and their layout along with congestion control to maintain Quality of Service.	Apply	C,P
CO5	Understand applications-layer protocols and elementary standards of cryptography & network security.	Understand	F,C

Subject Code: KCA 351
Subject Name: Artificial Intelligence Lab
Tagging COs with BLs & KCs

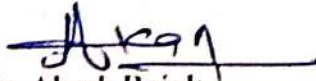| CO	CO Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Develop AI Game problems using Python such as Water-Jug and Missionaries-Cannibal	BL3	C,P
CO2	Analyse AI searching algorithms such as BFS & DFS using python	BL4	C,P
CO3	Implement Knowledge representation techniques using Pytholog library	BL3	C,P
CO4	Demonstrate machine learning algorithms of Classification & Clustering techniques	BL3	C,P

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Subject Code: KCA352		
Subject Name: SE LAB		
Tagging of COs with BLs and KCs		

CO	Statement	BL	KC
		(1,2,3,4,5,6)	(F,C,P,M)
CO1	Prepare a SRS document in line with the IEEE recommended standards.	3	P.M
CO2	Sketch the graphic representation of various UML diagrams using designing tools.	3	P.M
CO3	Prepare test cases for given problem.	4	P.M

Subject Code: KCA014		
Subject Name: Cloud Computing		
Tagging of COs with BLs and KCs		

CO	Statement	BL	KC
		(1,2,3,4,5,6)	(F,C,P,M)
CO1	Illustrate the concepts of Cloud Computing, key technologies, strengths, and limitations of cloud computing.	Apply	C,P
CO2	Apply cloud computing driven commercial systems such as AWS and other business cloud applications in real life.	Apply	C,P
CO3	Analyze the knowledge and applications of cloud computing in business, education and in personal.	Analyze	C,P
CO4	Connect with the concept of virtualization in cloud computing.	Analyze	C,P
CO5	Discuss the security and privacy issues in cloud computing	Understand	C

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Subject Code: KCA021		
Subject Name: Web Technology		
Tagging of COs with BLs and KCs		

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Construct static web pages using HTML and CSS.	Apply	C,P
CO2	Develop interactive web page using JavaScript.	Apply	C,P
CO3	Develop dynamic web applications using servlet and JSP.	Apply	C,P
CO4	Illustrate Spring-based Java applications using Java configuration, XML configuration, annotation-based configuration, beans and their scopes, and properties.	Analyze	C,P
CO5	Test web services using Spring Boot and REST API	Evaluate	C,P

Subject Code: KCA 034		
Subject Name: Data Analytics		
Tagging of COs with BLs and KCs		

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Explain data basics, growing field of big data analytics, and various phases of data analytics life cycle.	2	F, C
CO2	To build the system using machine learning supervised algorithm for decision making.	3	F, C, P
CO3	Apply the concept of data stream and real time analytics with case studies.	3	F, C
CO4	Develop the system using machine learning unsupervised algorithms for decision making.	3	F, C, P
CO5	Experiment with Hadoop and R tools that are required to manage and analyze data.	3	F, C, P

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Subject Code: KCA 353
Subject Name: Mini Project
Tagging COs with BLs & KCs

CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Demonstrate the software project using life cycle models.	3	C,P
CO2	Plan the SRS document as per project requirements.	4	C,P
CO3	Apply suitable design technique for designing software	3	C,P
CO4	Analyse the project by using a programming language.	4	C,P
CO5	Design report and able to present their work	3	C,P

Subject Code: KCA-052
Subject Name: Computer Graphics and Animation
Tagging of COs with BLs and KCs

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Demonstrate computer graphics algorithms for image creation and filling.	Apply	C,P
CO2	Practice the concepts of graphics related to clipping and transformations.	Apply	C,P
CO3	Illustrate the theory of three-dimensional curves, surfaces and projection.	Analyze	C,P
CO4	Analyze illumination models and visible surface detection.	Analyze	C,P
CO5	Express the fundamentals of animation, multimedia and its techniques.	Understand	C

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Subject Code: KCA-054		
Subject Name: Machine Learning		
Tagging of COs with BLs and KCs		

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	To understand the machine learning along with their real time application.	1,2,3	F, C
CO2	To understand the various types of learning algorithms along with their application in real time problem solving.	1,2,3	F, C
CO3	Sketch the problem with hand-craft features and understand the decision tree learning and instance-based learning technique.	1,2,3	F, C, P
CO4	Illustrate knowledge about Artificial Neural Networks and Deep Learning.	1,2,3	F, C, P
CO5	Demonstrate the knowledge of Reinforcement Learning and its application.	1,2,3,4	F, C, P

Subject Code: KCA051		
Subject Name: Mobile Computing		
Tagging of COs with BLs and KCs		

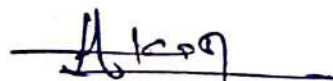| CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO 1	Understand the fundamentals of mobile computing.	2	C,P
CO 2	Explain wireless networking protocols, applications and environment.	2	C,P
CO 3	Elaborate data management issues in mobile computing.	2	C,P
CO 4	Review security and Transaction issues in mobile computing environment.	2	C,P
CO 5	Examine MANET routing protocols.	4	C,P

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Subject Code: KCA-035		
Subject Name: Software Quality Engineering		
Tagging of COs with BLs and KCs		
CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Understand basic concepts of Software Quality along with its documents and process	2	F, C
CO2	Apply knowledge of Software Quality in terms on Metrics & Measurement	3	F, C, P
CO3	Choose Software Reliability models for Quality Assessment	3	F, C, P
CO4	Illustrate the software Quality Planning and Assurance	3	F, C, P
CO5	Use Static and Dynamic Testing techniques during software implementation	3	F, C, P

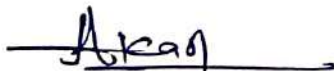| Subject Code: KCA031		
Subject Name: Privacy and Security in Online Social Media		
Tagging of COs with BLs and KCs		
CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Understand working of online social networks.	2	C
CO2	Describe trust management in online social media.	2	C
CO3	Compare counter measures to control information sharing in Online social networks.	2	C
CO4	Explain knowledge of identity management in Online social networks.	2	C
CO5	Apply privacy and security issues of OSN such as Facebook, Instagram, twitter and Linkedin.	3	C

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Subject Code: KCA041
Subject Name: Blockchain Architecture
Tagging of COs with BLs and KCs

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Understand basic concepts of blockchain architecture	2	C
CO2	Understand various requirements for consensus protocols.	2	C
CO3	Apply the consensus process using Hyperledger Fabric.	3	C, P
CO4	Analyze various use cases in financial software	4	C
CO5	Analyze various use cases in Government record keeping and supply chain.	4	C

Subject Code: KCA043
Subject Name: Internet of Things
Tagging of COs with BLs and KCs

CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Discuss the architecture and components of Internet of Things.	2	C
CO2	Discuss IoT enable Technologies, their challenges and paradigm.	2	C
CO3	Explore Transport layer protocols & communication models of IoT.	3	C
CO4	Analyze the pin diagram of Arduino and Raspberry Pi along with sensors and their interfaces.	4	C,P
CO5	Examine python programming modules and packages for communication among IoT Devices.	4	C,P

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Subject Code: KCA 101													
Subject Name: Fundamental of Computers & Emerging Technologies													
CO-PO/APO Matrix													
CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO 1	APO2
CO1	3	2	-	-	2	-	-	-	-	-	-	-	2	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	1	2	2	-	1	-	-	1	1	-	-	-
CO4	3	-	-	2	2	-	1	-	-	-	-	-	-	1
CO5	3	-	1	3	3	-	2	-	-	1	-	-	-	-
PO Target	3	2	1	2.33	2.25	-	1.33	-	-	1	1	-	2	1

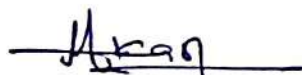| Subject Code: KCA102													
Subject Name: Problem Solving using C													
CO-PO/APO Matrix													
CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	3	3	-	-	-	-	3	-	2	-	1	1	3	-
CO2	3	2	-	-	-	-	2	-	-	-	1	1	3	-
CO3	3	2	-	-	-	-	2	-	-	-	1	1	3	-
CO4	3	2	-	-	-	-	2	-	-	-	1	1	3	-
CO5	3	2	-	-	-	-	2	-	-	-	1	1	3	-
PO Target	3	2.2	-	-	-	-	2.2	-	2	-	1	1	3	-

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DEPARTMENT OF COMPUTER APPLICATIONS
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Subject Code: KCA 103														
Subject Name: Principles of Management & Communication														
CO-PO/APO Matrix														
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	-	-	-	-	-	-	1	-	-	-	2	-	-	-
CO2	-	-	-	-	-	-	1	-	-	-	2	-	-	-
CO3	-	-	-	-	-	-	2	-	-	-	2	-	-	-
CO4	-	-	-	-	-	-	2	-	3	-	2	-	-	-
CO5	-	-	-	-	-	-	2	-	3	-	2	-	-	-
PO Target	-	-	-	-	-	-	1.6	-	3	-	2	-	-	-

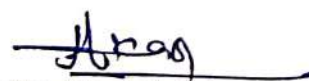|														
Subject Code: KCA-104														
Subject Name: Discrete Mathematics														
CO-PO/APO Matrix														
CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	2	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	1	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	2	-	-	-	-	-	-	-
PO Target	3	2	-	-	-	-	1.6	-	-	-	-	-	-	-

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Course Outcomes and Mapping of CO-PO, AY: 2023-24

Subject Code: KCA-105
Subject Name: Computer Organization and Architecture

CO-PO/APO Matrix

CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	3	1	-	-	-	-	1	-	-	-	-	-	-	-
CO2	3	1	-	-	-	-	1	-	-	-	-	-	-	-
CO3	3	1	-	-	-	-	1	-	-	-	-	-	-	-
CO4	3	1	-	-	-	-	1	-	-	-	-	-	-	-
CO5	3	1	-	-	-	-	1	-	-	-	-	-	-	-
PO Target	3	1	-	-	-	-	1	-	-	-	-	-	-	-

Subject Code: KCA151
Subject Name: Problem Solving Using C

CO-PO/APO Matrix

CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	-	2	-	-	-	-	1	-	-	-	1	1	3	-
CO2	3	2	-	-	-	-	2	-	-	-	1	1	3	-
CO3	3	2	-	-	-	-	2	-	-	-	1	1	3	-
CO4	3	2	-	-	-	-	2	-	-	-	1	1	3	-
CO5	3	2	-	-	-	-	2	-	-	-	1	1	3	-
PO Target	3	2	-	-	-	-	1.8	-	-	-	1	1	3	-

Subject Code: KCA-152
Subject Name: Computer Organization & Architecture Lab

CO-PO/APO Matrix

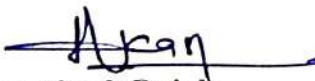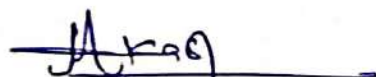| CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	2	-	-	-	-	2	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	1	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	1	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	1	-	-	-	-	-	-	-
PO Target	3	2	-	-	-	-	1.25	-	-	-	-	-	-	-

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Theory of Automata & Formal Languages (KCA-201)
CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	3	–	–	–	–	–	–	–	–	–	–	–	–
CO2	3	3	–	–	–	–	–	–	–	–	–	–	–	–
CO3	3	2	–	–	–	–	–	–	–	–	–	–	–	–
CO4	3	2	–	–	–	–	–	–	–	–	–	–	–	–
CO5	3	3	–	–	–	–	–	–	–	–	–	–	–	–
Target PO	3	3	–	–	–	–	–	–	–	–	–	–	–	–

Object Oriented Programming (KCA-202)
CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	3	–	–	–	–	–	–	–	–	–	–	3	–
CO2	3	3	3	–	2	–	2	–	–	–	–	–	3	1
CO3	3	3	3	–	2	–	2	–	–	–	–	–	3	1
CO4	3	3	3	–	2	–	2	–	–	–	–	–	3	1
CO5	2	2	2	–	2	–	1	–	–	–	–	–	–	2
Target PO	2.8	2.8	2.75	–	2	–	1.75	–	–	–	–	–	3	1.25

Operating Systems (KCA-203)
CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CO2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CO3	3	2	–	–	–	–	–	–	–	–	–	–	–	–
CO4	2	3	–	–	–	–	–	–	–	–	–	–	–	–
CO5	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Target PO	2.5	2.5	–	–	–	–	–	–	–	–	–	–	–	–

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Database Management Systems (KCA-204)

CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	2	2	–	3	–	–	–	–	–	–	–	–	3
CO2	3	2	1	–	3	–	–	–	–	–	–	–	–	3
CO3	3	3	3	–	2	–	–	–	–	–	–	–	–	3
CO4	1	1	–	–	–	–	–	–	–	–	–	–	–	–
CO5	2	1	2	–	–	–	–	–	–	–	–	–	–	–
Target PO	2.4	1.8	2	–	2.6	–	–	–	–	–	–	–	–	3

DA&AOA (KCA-205)

CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	–	–	1	–	–		–	–	–	–	–	–	–	–
CO2	–	–	3	–	–	2	–	–	–	2	–	–	–	1
CO3	–	–	3	–	–		–	–	–	2	–	–	–	1
CO4	–	–	3	–	–	2	–	–	–	3	–	–	–	1
CO5	–	–	3	–	–	2	–	–	–	3	–	–	–	1
Target PO	–	–	2.6	–	–	2	–	–	–	2.5	–	–	–	1

Object Oriented Programming Lab (KCA-251)

CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	3	–	–	–	–	–	–	–	–	–	–	3	–
CO2	3	3	3	–	2	–	2	–	–	–	–	–	3	1
CO3	3	3	3	–	2	–	2	–	–	–	–	–	3	1
CO4	3	3	3	–	2	–	2	–	–	–	–	–	3	1
CO5	2	2	2	–	2	–	1	–	–	–	–	–	–	2
Target PO	2.8	2.8	2.75	–	2	–	1.75	–	–	–	–	–	3	1.25

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DEPARTMENT OF COMPUTER APPLICATIONS
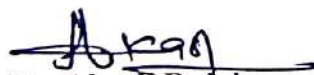## Course Outcomes and Mapping of CO-PO, AY: 2023-24

DBMS Lab (KCA-252)
CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	–	–	–	–	3	–	–	–	–	–	–	–	–	3
CO2	–	–	–	–	3	–	–	–	–	–	–	–	–	3
CO3	–	–	–	–	3	–	–	–	–	–	–	–	–	3
Target PO	–	–	–	–	3	–	–	–	–	–	–	–	–	3
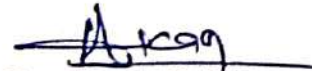
Data Structures & Analysis of Algorithms Lab (KCA-253)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	3	–	–	–	–	–	–	–	–	–	–	3	2
CO2	3	3	–	–	–	–	–	–	–	–	–	–	3	2
CO3	3	3	–	–	–	–	–	–	–	–	–	–	3	3
CO4	3	3	–	–	–	–	–	–	–	–	–	–	3	3
Target PO	3	3	–	–	–	–	–	–	–	–	–	–	3	2.5

Cyber Security (KCA-01)
CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	–	–	1	–	–	–	–	–	–	–	–	–	–	–
CO2	–	–	3	–	–	2	–	–	–	2	–	–	–	1
CO3	–	–	3	–	–		–	–	–	2	–	–	–	1
CO4	–	–	3	–	–	2	–	–	–	3	–	–	–	1
CO5	–	–	3	–	–	2	–	–	–	3	–	–	–	1
Target PO	–	–	2.6	–	–	2	–	–	–	2.5	–	–	–	1

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Subject Code: KCA 301
Subject Name: Artificial Intelligence
CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3		—	—	—	—	—	—	—	—	—	—	—	—
CO2	3	3	2	3	—	—	—	—	—	—	—	—	2	—
CO3	3	3	2	2	2	—	—	—	—	—	—	—	—	—
CO4	3	3	2	2	2	—	—	—	—	—	—	—	2	—
CO5	3	3	3	2	2	—	—	—	—	—	—	—	1	—
PO Target	3	3	2.25	2.25	2	—	—	—	—	—	—	—	1.67	—

Subject Code: KCA302
Subject Name: Software Engineering
CO-PO/APO Matrix

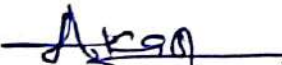| CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	2	—	—	—	—	—	—	—	—	—	—	—	1
CO2	3	2	—	1	—	1	2	—	2	—	—	—	—	2
CO3	3	3	—	2	—	—	—	—	2	—	—	—	—	3
CO4	3	—	—	—	—	2	—	—	—	—	—	—	—	2
CO5	3	2	—	1	—		—	2	—	—	—	—	—	1
Target PO	3	2.25	—	1.33	—	1	2	2	2	—	—	—	—	1.8

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Course Outcomes and Mapping of CO-PO, AY: 2023-24

Subject Code: KCA303

Subject Name: Computer Network

CO-PO/APO Matrix

CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	3	—	—	—	—	—	2	—	—	—	—	—	—	—
CO2	3	2	—	—	—	—	1	—	—	—	—	—	—	—
CO3	3	2	—	—	—	—	2	—	—	—	—	—	—	—
CO4	2	1	—	—	—	1	1	—	—	—	—	—	—	—
CO5	2	1	—	—	—	1	1	—	—	—	—	—	—	—
PO Target	2.6	1.5	—	—	—	1	1.4	—	—	—	—	—	—	—

Subject Code: KCA 351

Subject Name: Artificial Intelligence Lab

CO-PO/APO Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	1	2	—	—	2	—	—	—	—	—	1	—	2	—
CO2	1	2	—	—	2	—	—	—	—	—	1	—	2	—
CO3	1	2	—	—	2	—	—	—	—	—	1	—	2	—
CO4	1	2	1	1	2	—	—	—	—	—	2	—	2	—
PO Target	1	2	1	1	2	—	—	—	—	—	1.25	—	2	—
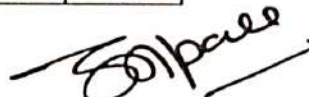
Subject Code: KCA352

Subject Name: SE LAB

CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	2	3	—	—	—	—	—	—	3	—	2	—	—	2
CO2	3	3	2	1	2	—	—	—	3	—	2	—	—	2
CO3	2	1	2	—	2	—	3	—	3	—	2	3	—	3
Target PO	2.33	2.33	2	1	2	—	3	—	3	—	2	3	—	2.33

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DEPARTMENT OF COMPUTER APPLICATIONS

Course Outcomes and Mapping of CO-PO, AY: 2023-24

Subject Code: KCA014
Subject Name: Cloud Computing
CO-PO/APO Matrix

CO	1	2	3	4	5	6	7	8	9	10	11	12	APO1	APO2
CO1	3	—	2	3	3	1	2	2	1	2	3	2	—	3
CO2	3	2	3	3	3	—	3	1	1	1	3	2	—	3
CO3	3	2	3	3	3	—	3	1	1	1	3	2	—	3
CO4	3	2	3	3	3	—	3	1	1	1	3	2	—	3
CO5	2	—	1	—	—	2	1	—	2	2	1	—	—	1
PO Target	2.8	2	2.4	3	3	1.5	2.4	1.25	1.2	1.4	2.6	2	—	2.6

Subject Code: KCA021
Subject Name: Web Technology
CO-PO/APO Matrix

CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	—	—	1	—	1	—	1	—	—	—	—	1	—	1
CO2	—	—	1	—	1	—	2	—	—	—	—	2	—	2
CO3	—	—	2	—	2	—	2	—	—	—	—	2	—	2
CO4	—	—	1	—	1	—	2	—	—	—	—	1	—	1
CO5	—	—	2	—	3	—	2	—	—	—	—	3	—	3
PO Target	—	—	1.4	—	1.6	—	1.8	—	—	—	—	1.8	—	1.8

Subject Code & Name: KCA 034(Data Analytics)
CO-PO/APO Matrix

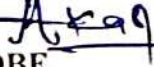|	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	—	1	1	1	1	1	2	—	2	1	1	1	—	—
CO2	2	1	2	3	3	1	2	—	2	2	2	2	1	2
CO3	—	1	2	1	—	1	2	—	2	1	1	—	—	—
CO4	1	2	1	3	3	1	2	—	2	2	2	2	1	2
CO5	1	2	2	3	3	1	2	—	2	2	2	2	—	3
PO Target	1.3	1.4	1.6	2.2	2.5	1	2	—	2	1.6	1	1.8	1	2.3

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DEPARTMENT OF COMPUTER APPLICATIONS
Course Outcomes and Mapping of CO-PO, AY: 2023-24

Subject Code: KCA 353

Subject Name: Mini Project

CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	1	2	2	—	—	—	3	—	1	—	—	3	—	3
CO2	1	2	1	—	—	—	3	—	3	—	—	3	—	3
CO3	2	2	2	—	—	—	3	—	2	—	—	3	—	3
CO4	3	2	2	—	—	—	3	—	2	—	—	3	—	3
CO5	1	1	2	—	—	—	3	—	3	—	—	3	—	3
Target PO	1.6	1.8	1.8	—	—	—	3	—	2.2	—	—	3	—	3

Subject Code & Name: KCA-052 (Computer Graphics and Animation)

CO-PO/APO Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	3	1	1	1	—	1	—	—	—	—	—	—	—
CO2	—	3	—	2	1	—	—	—	—	—	—	—	—	—
CO3	—	3	—	2	2	—	—	—	—	—	—	—	—	—
CO4	3	3	1	1	1	—	1	—	—	—	1	—	—	—
CO5	—	—	—	—	2	—	1	—	—	—	—	—	—	1
Target PO	3	3	1	1.5	1.4	—	1	—	—	—	1	—	—	1

Subject Code & Name: KCA-054 (Machine Learning)

CO-PO/APO Matrix

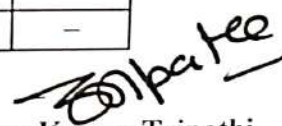|	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	3	2	—	—	—	—	—	—	—	—	—	—	—	—
CO2	3	2		2	3	—	—	—	—	—	—	—	2	—
CO3	3	2	3	3	3	—	—	—	—	—	—	—	2	—
CO4	3	3	2	2	2	—	—	—	—	—	—	—	—	—
CO5	3	3	2	2	2	—	—	—	—	—	—	—	2	—
PO Target	3	2.4	2.33	2.25	2.5	—	—	—	—	—	—	—	2	—

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Course Outcomes and Mapping of CO-PO, AY: 2023-24
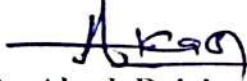
Subject Code & Name: KCA051(Mobile Computing)

CO-PO/APO Matrix

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	3	-	-	-	-	-	2	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	1	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	2	-	-	-	-	-	-	-
CO4	2	1	-	-	-	-	1	-	-	-	-	-	-	-
CO5	2	1	-	-	-	1	1	-	-	-	-	-	-	-
PO Target	2.6	1.5	-	-	-	1	1.4	-	-	-	-	-	-	-

Subject Code & Name: KCA-035(Software Quality Engineering)

CO-PO/APO Matrix

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	1		—	—		—	—	—	1	—	—	—	—	—
CO2	1	3	—	—	2	—	—	—	—	—	—	—	—	—
CO3	2	2	—	—	1	—	—	—	—	—	—	—	—	—
CO4	—	1	—	1	1	—	—	—	—	—	—	—	—	—
CO5	2	1	3	—	3	—	—	—	—	—	—	—	3	—
PO Target	1.5	1.75	3	1	1.75	—	—	—	1	—	—	—	3	—

Subject Code & Name: KCA031 (Privacy and Security in Online Social Media)

CO-PO/APO Matrix

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	—	1	—	2		—	—	1	—	—	—	—	—	—
CO2	—	2	—	3	2	—	2	1	—	2	—	—	—	—
CO3	—	2	—	3	2	—	2	1	—	2	—	—	—	—
CO4	—	2	—	3	2	—	2	1	—	2	—	—	—	—
CO5	—	2	—		2	—	2	—	3	—	—	—	—	—
PO Target	—	1.8	—	2.75	2	—	2	1	3	2	—	—	—	—

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DEPARTMENT OF COMPUTER APPLICATIONS
Course Outcomes and Mapping of CO-PO, AY: 2023-24

Subject Code & Name: KCA041(Blockchain Architecture)

CO-PO/APO Matrix

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	3	-	-	-	-	1	2	-	-	-	-	-	-	-
CO2	3	2	-	-	-	2	1	-	-	-	-	-	-	-
CO3	3	2	-	-	2	1	1	-	-	-	-	-	-	2
CO4	2	1	-	1	1	1	2	-	-	-	-	-	-	1
CO5	2	1	-	1	1	1	2	-	-	-	-	-	-	1
PO Target	2.6	1.5	-	1	1.3	1.2	1.6	-	-	-	-	-	-	1.3

Subject Code & Name: KCA043 (Internet of Things)

CO-PO/APO Matrix

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO1	APO2
CO1	2	–	–	3	–	–	2	–	–	–	–	–	–	–
CO2	2	3	2	3	–	2	2	–	–	2	–	–	–	–
CO3	3	–	–	1	–	–	1	–	–	–	–	–	–	–
CO4	3	1	1	–	3	–	3	–	–	1	1	2	–	3
CO5	3	3	1	3	3	–	3	–	–	1	1	2	–	3
PO Target	2.6	2.33	1.33	2.5	3	2	2.2	–	–	1.33	1	2	–	3

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