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MCA-I SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA101**		
Subject Name:	**Fundamental of Computers & Emerging Technologies**		
Tagging of COs with BLs and KCs			
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.	3	P
CO2	Demonstrate the features and types of operating system and computer networks.	2	C
CO3	Illustrate the basic services of Internet and applications of Internet of Things.	2	C
CO4	Examine the features of Blockchain, Cryptocurrency and benefits of cloud computing.	2	C
CO5	Discuss the emerging trends and technologies in the field of Information Technology.	2	C

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	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 Teachers

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA102**		
Subject Name:	**Problem Solving using C**		
Tagging of COs with BLs and KCs			
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.	3	P
CO2	Write 'C' programs that incorporate use of variables, operators, and expressions along with data types	3	P
CO3	Implement programs using the control statements, functions, arrays, and strings.	3	P
CO4	Write programs using the advanced concepts like pointers, structures, union, and enumerated data types.	3	P
CO5	Apply file I/ O operations on Binary and Text Files	3	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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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MCA-I SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA103**		
Subject Name:	**Principles of Management & Communication**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Describe primary features, processes and principles of management.	2	C
CO2	Explain the functions of management in terms of planning, organizing and decision making.	3	C
CO3	Illustrate key factors of leadership skill in directing and controlling business resources and processes.	3	C
CO4	Exhibit adequate verbal and non-verbal communication skills at workplace.	3	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.	3	P

CO-PO/APO Matrix														
	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 Teachers

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA104**		
Subject Name:	**Discrete Mathematics**		
Tagging of COs with BLs and KCs			
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	3	P
CO2	Apply mathematical arguments using logical connectives and quantifiers to check the validity of an argument.	3	P
CO3	Prove properties of Algebraic Structures like Groups, Rings and Fields	3	P
CO4	Solve recurrences relations and generating functions using mathematical logics.	3	P
CO5	Illustrate the concept of combinatorics to solve basic problems in discrete mathematics	4	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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 WITH PO, 2021-22

Subject Code:	**KCA105**		
Subject Name:	**Computer Organization and Architecture**		
Tagging of COs with BLs and KCs			
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.	3	P
CO2	Demonstrate the various processor organisations with different addressing modes.	3	P
CO3	Examine the organizations of control unit along with Instruction execution stages and pipeline concept.	3	P
CO4	Analyse the different types of memories and its organization.	4	P
CO5	Illustrate the modes of communication between IO devices and CPU.	3	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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	-	-	-	-	-	-	-

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MCA-I SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA151**		
Subject Name:	**Problem Solving Using C Lab**		
Tagging of COs with BLs and KCs			
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.	3	P
CO2	Write programs using variables, operators, and expressions along with data types.	3	P
CO3	Implement programs for decision control structures, loops, and arrays.	3	P
CO4	Illustrate concepts of structure, pointer and user defined function.	3	P
CO5	Write programs using graphics and file handling operations.	3	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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	-

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA152**		
Subject Name:	**Computer Organization & Architecture Lab**		
Tagging of COs with BLs and KCs			
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.	3	C
CO2	Demonstrate various combinational circuits for binary arithmetic operations and code converter	3	P
CO3	Illustrate combinational circuits and sequential circuits such as encoders/decoders, multiplexers/de-multiplexers, and flip-flops	3	P
CO4	Implement 2-bit Arithmetic Logic Unit using logic gates and multiplexers	3	P

CO-PO/APO Matrix														
	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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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA153**		
Subject Name:	**Professional Communication Lab**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Differentiate various situations to communicate effectively for conversation and public speaking.	4	P
CO2	Utilize required voice dynamics to speak effectively for handling various situations at workplace like presentation and official speaking.	3	P
CO3	Apply argumentation skills to participate in group discussion and role play.	3	P
CO4	Evaluate to summarize topics for thematic presentation and presentation for seminar, workshop, and conference with focus on kinesics.	5	P
CO5	Develop communicative abilities in all four dimensions of language.	6	M

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	-	-	-	-	-	-	3	-	3	-	3	-	-	-
CO2	-	-	-	-	-	-	3	-	3	-	3	-	-	-
CO3	-	-	-	-	-	-	3	-	3	-	3	-	-	-
CO4	-	-	-	-	-	-	3	-	3	-	3	-	-	-
CO5	-	-	-	-	-	-	3	-	3	-	3	-	-	-
PO Target	-	-	-	-	-	-	3	-	3	-	3	-	-	-

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MCA-II SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA201**		
Subject Name:	**Theory of Automata & Formal Languages**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Construct DFA, NFA with their minimization and conversion.	5	C
CO2	Implement regular expressions with closure and decision properties.	3	P
CO3	Represent the Context Free Languages grammar and its normal forms.	3	C
CO4	Design the PDA with deterministic and Nondeterministic properties	5	P
CO5	Construct the Universal Turing machine.	5	M

CO-PO/APO Matrix														
	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	–	–	–	–	–	–	–	–	–	–	–	–
PO Target	3	3	–	–	–	–	–	–	–	–	–	–	–	–

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MCA-II SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA202**		
Subject Name:	**Object Oriented Programming**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**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

CO-PO/APO Matrix														
	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
PO Target	2.8	2.8	2.75	–	2	–	1.75	–	–	–	–	–	3	1.25

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA203**		
Subject Name:	**Operating Systems**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Understand main components, services, types, and structure of Operating Systems.	2	C
CO2	Apply various CPU scheduling algorithms for process execution.	3	P
CO3	Apply the various concurrency control algorithms and techniques to handle various concurrency control issues.	3	P
CO4	Apply various memory management techniques.	3	P
CO5	Apply various I/O management, and disk management techniques.	3	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	2	-	-	-	-	-	2	-	-	-	-	-	-	-
CO2	2	1	-	-	-	-	2	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	2	-	-	-	-	-	-	-
CO4	2	1	-	-	-	-	2	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	2	-	-	-	-	-	-	-
PO Target	2.4	1.5	–	–	–	–	2	–	–	–	–	–	–	–

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA204**		
Subject Name:	**Database Management Systems**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Construct overall structure of DBMS, ER Models for efficient Database Design.	3	P
CO2	Express basic concepts of relational model and solutions to a query problem using SQL commands, relational algebra, tuple calculus and domain calculus.	3	P
CO3	Analyse the need of Normalization while classifying any given relation to the desired normal form.	4	P
CO4	Illustrate the concept of transaction processing and recovery mechanism from transaction failures.	3	P
CO5	Classify various concurrency control techniques on different transactions.	3	P

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

Subject Teachers

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA205**		
Subject Name:	**Data Structures & Analysis of Algorithms**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Demonstrate the concept of types of data structure such as arrays and linked lists along with the analysis of algorithms.	3	P
CO2	Apply the concept of stacks to solve various problem.	3	P
CO3	Illustrate the concept of graphs and trees with its applications	3	P
CO4	Compare incremental and divide-and-conquer approaches of designing algorithms forproblems such as sorting and searching.	4	P
CO5	Analyse various design approaches such as greedy and dynamic programming for solving real life problems.	4	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	3	–	–	–	–	3	–	–	–	–	–	3	2
CO2	3	3	1	–	1	–	3	–	–	–	–	–	3	2
CO3	3	3	2	–	2	–	3	–	–	–	–	–	3	1
CO4	3	3	2	–	2	–	3	–	–	–	–	–	3	3
CO5	3	3	2	–	2	–	3	–	–	–	–	–	3	3
PO Target	3	3	1.75	–	1.75	–	3	–	–	–	–	–	3	2.2

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA251**		
Subject Name:	**Object Oriented Programming Lab**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Write programs in a Java programming environment.	3	P
CO2	Execute Object Oriented Programs using Java programming	4	P
CO3	Write robust file handling and Object-Oriented Programs with excepting handling approach using Java programming.	3	P
CO4	Construct Object Oriented Programs with multi-threading and generic programming approach using Java programming.	3	P
CO5	Design GUI application with AWT and Swing using Java programming	5	P

CO-PO/APO Matrix														
	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
PO Target	2.8	2.8	2.75	–	2	–	1.75	–	–	–	–	–	3	1.25

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA252**		
Subject Name:	**DBMS Lab**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Illustrate ER models using Case Tools.	3	P
CO2	Exercise SQL Commands to query a database.	3	P
CO3	Express PL/ SQL Programs for implementing stored procedures, stored functions, cursors, triggers and packages	3	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	2	2	–	–	3	–	–	–	–	–	–	–	–	3
CO2	2	2	–	–	3	–	–	–	–	–	–	–	2	3
CO3	–	–	–	–	3	–	2	–	–	–	–	–	2	3
PO Target	2	2	–	–	3	–	2	–	–	–	–	–	2	3

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MCA-II SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA253**		
Subject Name:	**Data Structures & Analysis of Algorithms Lab**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Apply various operations in arrays.	3	P
CO2	Apply operations of Stacks and Queues using both arrays and linked lists.	3	P
CO3	Examine various searching and sorting algorithms.	3	P
CO4	Implement graph algorithm to solve the various real-life problems.	3	P

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

Subject Teachers

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MCA-II SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCAA01**		
Subject Name:	**Cyber Security**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Understand the importance of Information, Information System and need of security threat counter measures.	2	C
CO2	Understand information repositories and related threats to them.	2	C
CO3	Elaborate Information System based activities and concerned data for suggesting possible threats appear to them.	3	P
CO4	Clarify the need of framing the required security policy for safeguarding the Information System under the use.	3	C
CO5	Characterize the legal provisions available in India and Internationally for protecting intellectual properties.	3	C

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

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MCA-III SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA301**		
Subject Name:	**Artificial Intelligence**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO-1	Describe knowledge of the building blocks of AI as presented in terms of intelligent agents.	2	C
CO-2	Sketch the problem as state space graph with various searching techniques to solve a specific problem.	3	P
CO-3	Demonstrate knowledge and its representation in real world with logical reasoning steps.	3	P
CO-4	Construct AI algorithm for real world problems with different machine learning techniques.	3	P
CO-5	Illustrate knowledge about state-of-the-art algorithms used in pattern recognition area.	3	P

CO-PO/APO Matrix														
	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 Teachers

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MCA-III SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

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	P
CO2	Prepare Software Requirement Specification (SRS) with Modelling tools and Quality standards.	3	P
CO3	Analyse design concepts to software development with software metrics methods.	4	P
CO4	Categorize software testing techniques and its implementation.	4	P
CO5	Contrast Software project management activities with its parameters such as Cost, Efforts, Schedule/ Duration.	4	P

CO-PO/APO Matrix														
	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

Subject Teachers

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

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.	2	C
CO2	Apply knowledge of error detection, correction and learn concepts of flow control along with error control.	3	P
CO3	Apply IP addressing techniques, subnetting along with network routing protocols and algorithms.	3	P
CO4	Explore transport layer protocols and their layout along with congestion control to maintain Quality of Service.	3	P
CO5	Understand applications-layer protocols and elementary standards of cryptography & network security.	2	C

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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	–	–	–	–	–	–	–

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MCA-III SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA351**		
Subject Name:	**Artificial Intelligence Lab**		
Tagging of COs with BLs and KCs			
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	3	P
CO2	Analyse AI searching algorithms such as BFS & DFS using python	4	P
CO3	Implement Knowledge representation techniques using Pytholog library	3	P
CO4	Demonstrate machine learning algorithms of Classification & Clustering techniques	3	P

CO-PO/APO Matrix														
	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 Teachers

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA352**		
Subject Name:	**SE LAB**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Prepare a SRS document in line with the IEEE recommended standards.	3	M
CO2	Sketch the graphic representation of various UML diagrams using designing tools.	3	M
CO3	Prepare test cases for given problem.	4	M

CO-PO/APO Matrix														
	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

Subject Teachers

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COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA353**		
Subject Name:	**Mini Project**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Demonstrate the software project using life cycle models.	3	P
CO2	Plan the SRS document as per project requirements.	4	P
CO3	Apply suitable design technique for designing software	3	P
CO4	Analyse the project by using a programming language.	4	P
CO5	Design report and able to present their work	3	P

CO-PO/APO Matrix														
	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 Teachers

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MCA-III SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA014**		
Subject Name:	**Cloud Computing**		
Tagging of COs with BLs and KCs			
CO	**Statement**	**BL (1,2,3,4,5,6)**	**KC (F,C,P,M)**
CO1	Illustrate the concepts of Cloud Computing, key technologies, strengths, and limitations of cloud computing.	3	P
CO2	Apply cloud computing driven commercial systems such as AWS and other business cloud applications in real life.	3	P
CO3	Analyze the knowledge and applications of cloud computing in business, education and in personal.	4	P
CO4	Connect with the concept of virtualization in cloud computing.	4	P
CO5	Discuss the security and privacy issues in cloud computing	2	C

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	3	–	2	3	3	1	2	2	1	2	3	2	1	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	1	2.6

Subject Teachers

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MCA-III SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

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.	3	P
CO2	Develop interactive web page using JavaScript.	3	P
CO3	Develop dynamic web applications using servlet and JSP.	3	P
CO4	Illustrate Spring-based Java applications using Java configuration, XML configuration, annotation-based configuration, beans and their scopes, and properties.	4	P
CO5	Test web services using Spring Boot and REST API	5	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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 Teachers

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MCA-IV SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA034**		
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	C
CO2	Build the system using machine learning supervised algorithm for decision making.	3	P
CO3	Apply the concept of data stream and real time analytics with case studies.	3	C
CO4	Develop the system using machine learning unsupervised algorithms for decision making.	3	P
CO5	Experiment with Hadoop and R tools that are required to manage and analyse data.	3	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	–	1	1	1	1	1	2	–	–	1	1	1	–	–
CO2	2	1	2	3	3	1	2	–	–	2	2	2	1	2
CO3	–	1	2	1	–	1	2	–	–	1	1	–	–	–
CO4	1	2	1	3	3	1	2	–	–	2	2	2	1	2
CO5	1	2	2	3	3	1	2	–	–	2	2	2	–	3
PO Target	1.3	1.4	1.6	2.2	2.5	1	2	–	–	1.6	1.6	1.8	1	2.3

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MCA-IV SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA052**		
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.	3	P
CO2	Practice the concepts of graphics related to clipping and transformations.	3	P
CO3	Illustrate the theory of three-dimensional curves, surfaces and projection.	4	P
CO4	Analyze illumination models and visible surface detection.	4	P
CO5	Express the fundamentals of animation, multimedia and its techniques.	2	C

CO-PO/APO Matrix														
	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

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MCA-IV SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA054**		
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	Demonstrate the need of machine learning approach along with their real time application.	2	C
CO2	Apply various types of learning algorithms on real time problems.	2	C
CO3	Outline the problem with hand-craft features, decision tree learning and instance-based learning technique.	3	P
CO4	Illustrate knowledge about Artificial Neural Networks and Deep Learning.	3	P
CO5	Analyse the Reinforcement Learning and its application.	3	P

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

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MCA-IV SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

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	P
CO 2	Explain wireless networking protocols, applications and environment.	2	P
CO 3	Elaborate data management issues in mobile computing.	2	P
CO 4	Review security and Transaction issues in mobile computing environment.	2	P
CO 5	Examine MANET routing protocols.	4	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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	-	-	-	-	-	-	-

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MCA-IV SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA035**		
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	C
CO2	Apply knowledge of Software Quality in terms on Metrics & Measurement	3	P
CO3	Choose Software Reliability models for Quality Assessment	3	P
CO4	Illustrate the software Quality Planning and Assurance	3	P
CO5	Use Static and Dynamic Testing techniques during software implementation	3	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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	–

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MCA-IV SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

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

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	–	1	–	2		–	2	1	–	–	–	–	–	–
CO2	–	2	–	3	2	–	2	1	–	2	–	–	–	–
CO3	–	2	–	3	2	–	3	1	–	2	–	–	–	–
CO4	–	2	–	3	2	–	2	1	–	2	–	–	–	–
CO5	–	2	–		2	–	2	–	3	–	–	–	–	–
PO Target	–	1.8	–	2.75	2	–	2.2	1	3	2	–	–	–	–

Subject Teacher

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MCA-IV SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

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	Demonstrate 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	P
CO5	Examine python programming modules and packages for communication among IoT Devices.	4	P

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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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MCA-IV SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

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	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

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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

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MCA-IV SEMESTER

COURSE OUTCOMES AND MAPPING WITH PO, 2021-22

Subject Code:	**KCA451**		
Subject Name:	**Project**		
Tagging of COs with BLs and KCs			
CO	Statement	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Understand the current scenario of technologies	2	P
CO2	Illustrate the concept of SDLC	3	P
CO3	Demonstrate effective use of written/ verbal communication through documentation and report writing as per University & Industry standards	3	P
CO4	Create a project with consideration of customer requirements and the goals	6	M
CO5	Implement the project with proper testing techniques	6	M

CO-PO/APO Matrix														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	APO1	APO2
CO1	-	-	-	2	3	3	1	-	-	-	-	1	1	1
CO2	-	-	-	3	1	3	2	-	-	3	-	1	3	3
CO3	-	-	-	2	1	3	-	3	3	3	-	1	2	1
CO4	-	-	-	1	-	3	3	-	-	-	-	1	-	-
CO5	-	-	-	-	-	3	-	-	-	-	-	3	-	-
PO Target	-	-	-	2	1.67	3	2	3	3	3	-	1.4	2	1.67

Subject Teacher

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