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Department of Computer Applications

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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

Dr. Amit K. Gupta [Subject Expert]

Ms. Divya Singhal

Dr. Ajay K. Shrivastava
Head, CA



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MCA-I SEMESTER

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	-

Subject Teachers

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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


 Dr. Sonia Gouri [Subject Expert]


 Dr. Amit Kumar Arora [Subject Expert]


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MCA-I SEMESTER

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	-	-	-	-	-	-	-

Subject Teachers

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MCA-I SEMESTER

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	-	-	-	-	-	-	-

Subject Teachers

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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	-

Subject Teachers

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MCA-I SEMESTER

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	-	-	-	-	-	-	-

Subject Teachers

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MCA-I SEMESTER

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	-	-	-

Subject Teachers

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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	–	–	–	–	–	–	–	–	–	–	–	–

Subject Teachers

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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

Subject Teachers

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MCA-II SEMESTER

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	-	-	-	-	-	-	-

Subject Teachers

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MCA-II SEMESTER

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

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MCA-II SEMESTER

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 for problems 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

Subject Teachers

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MCA-II SEMESTER

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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MCA-II SEMESTER

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

Mr. Ankit Verma

Ms. Shalika

Mr. Prashant Agrawal [Subject Expert]

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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

Subject Teachers

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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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Ms. Neelam Rawat [Subject Expert]

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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

Ms. Neelam Rawat

Dr. Aruni K. Tripathi [Subject Expert]

Dr. Amit Kumar

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MCA-III SEMESTER

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	—	—	—	—	—	—	—

Subject Teachers

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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

Mr. Prashant Agrawal

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MCA-III SEMESTER

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

Ms. Neelam Rawat

Dr. Aruni K. Tripathi [Subject Expert]

Dr. Amit Kumar

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MCA-III SEMESTER

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

Mr. Naresh Chandra

Mr. Ankit Verma

Dr. Shashank Bhardwaj [Subject Expert]

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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

Mr. Amit K. Goyal

Ms. Shalika

Ms. Vidushi

Dr. Shashank Bhardwaj [Subject Expert]

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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

Dr. Vipin Kumar [Subject Expert]

Mr. Naresh Chandra

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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

Subject Teacher

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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

Subject Teacher

Dr. Akash Rajak

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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

Subject Teacher

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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	-	-	-	-	-	-	-

Subject Teacher

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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	–

Subject Teacher

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Mr. Ankit Verma

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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

Mr. Prashant Agrawal

Dr. Ajay K. Shrivastava
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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

Subject Teacher

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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

Subject Teacher

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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

Dr. Arun K. Tripathi

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