KIET Group of Institutions, Ghaziabad

Department of Computer Applications

(An ISO – 9001: 2015 Certified & 'A' Grade accredited Institution by NAAC)

FUNDAMENTAL OF COMPUTERS & EMERGING TECHNOLOGIES

KCA-101

Tagging of COs with BLs and KCs

Course Outcomes (COs)		Bloom's Knowledge Level (BL)	Knowledge Category (KC)
At the end of this course, Student will be able to			
CO-1	Develop the basic knowledge of computer components and algorithms to solve problems using programming concepts.	Apply	Conceptual & Procedural
CO-2	Demonstrate the features and types of operating system and computer networks.	Understand	Conceptual
CO-3	Illustrate the basic services of Internet and the applications of IoT.	Understand	Conceptual
CO-4	Examine the features of Blockchain, Cryptocurrency and benefits of cloud computing.	Understand	Conceptual
CO-5	Discuss the emerging trends and technologies in the field of Information Technology.	Understand	Conceptual

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 Teachers
(Ms. Divya Singhal)

Subject Expert
(Dr. Akash Rajak)

Dr. Ajay K Shrivastava
Head-CA

Approved by BoS

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Problem Solving Using C (KCA-102)

Tagging of COs with BLs & KCs

CO No.	Statement of Course Outcome	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
After completion of the course, the student will be able to			
CO-1	Solve basic problems with the help of flowcharts and algorithms.	Apply	Conceptual, Procedural
CO-2	Write 'C' programs that incorporate use of variables, operators, and expressions along with data types.	Apply	Factual, Conceptual, Procedural
CO-3	Implement programs using the control statements, functions, arrays, and strings.	Apply	Conceptual, Procedural
CO-4	Write programs using the advanced concepts like pointers, structures, unions, and enumerated data types.	Apply	Conceptual, Procedural
CO-5	Apply file I/O operations on Binary and Text files.	Apply	Procedural, Conceptual

CO - PO / APO Matrix

KCA102:	Programme Outcome (PO)												APO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
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	-

Dr. Sangeeta Arora
(Subject Teacher)

Mr. R N Panda
(Subject Expert)

Mr. Prashant Agarwal
(Subject Teacher)

Dr. Ajay K Shrivastava
(Head-CA)

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Principles of Management & Communication (KCA-103)

Tagging COs with BLs & KCs

S.NO	COURSE OUTCOME	Blooms' Cognitive Process (BL)	Knowledge Category (KC)
After Completion of course, the student will be able to:			
CO-1	Describe primary features, processes and principles of management.	Understand	Conceptual
CO-2	Explain the functions of management in terms of planning, organizing and decision making.	Apply	Conceptual
CO-3	Illustrate key factors of leadership skill in directing and controlling business resources and processes.	Apply	Conceptual
CO-4	Exhibit adequate verbal and non-verbal communication skills at workplace.	Apply	Factual & Conceptual
CO-5	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	Conceptual & Procedural

CO-PO-APO Martix

	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	-	-	-
Average (PO Target)							1.6		3		2			

Dr. Sonia Goutri
(Subject Teacher/Expert)

Dr. Ajay K Shrivastava
(Head-CA)

Dr. Amit Kumar Arora
(Subject Teacher/Expert)

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Discrete Mathematics (KCA-104)

Tagging of COs with BLs & KCs

CO No.	Statement of Course Outcome	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
After completion of the course, the student will be able to			
CO1	Examine the mathematical and logical notation for basic discrete structures such as Sets, Relations and Functions.	Apply	Conceptual & Procedural
CO2	Apply mathematical arguments using logical connectives and quantifiers to check the validity of an argument.	Apply	Conceptual & Procedural
CO3	Prove properties of Algebraic Structures like Groups, Rings and Fields.	Apply	Conceptual & Procedural
CO4	Solve recurrences relations and generating functions using mathematical logics.	Apply	Conceptual & Procedural
CO5	Illustrate the concept of combinatorics to solve basic problems in discrete mathematics.	Analyze	Conceptual & Procedural

CO - PO/APO Matrix

Course Code:	Programme Outcome (PO)												APO1	APO2
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	2	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	1	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	2	-	-	-	-	-	-	-
PO Target	3	2	-	-	-	-	1	-	-	-	-	-	-	-

Subject Expert

Ms. Shalika

Dr. Ajay Kr. Shrivastava
(Head- CA)

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Computer Organization and Architecture (KCA-105)

Tagging of COs with BLs & KCs

CO No.	Statement of Course Outcome	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
After completion of the course, the student will be able to			
CO1	Determine the functional units of digital system and operations performed by arithmetic and logical unit.	Apply	Conceptual & Procedural
CO2	Demonstrate the various processor organisations with different addressing modes.	Apply	Conceptual & Procedural
CO3	Examine the organizations of control unit along with Instruction execution stages and pipeline concept.	Apply	Conceptual & Procedural
CO4	Analyze the different types of memories and its organization.	Analyze	Conceptual & Procedural
CO5	Illustrate the modes of communication between IO devices and CPU.	Apply	Conceptual & Procedural

CO - PO/APO Matrix

Course Code:	Programme Outcome (PO)												APO1	APO2
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
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

Dr. Ajay Kumar Shrivastava(Expert)

Ms. Shalika

Mr. Amit Goyal

Approved by BOS

Dr. Ajay Kr. Shrivastava
(Head- CA)

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Problem Solving Using C LAB (KCA-151)

Tagging of Cos with BLs & KCs

CO No.	Statement of Course Outcome	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
After completion of the course, the student will be able to			
CO-1	Demonstrate Integrated Development Environment (IDE) for compilation, debugging and execution of C program.	Apply	Conceptual, Procedural
CO-2	Write programs using variables, operators, and expressions along with data types.	Apply	Conceptual, Procedural
CO-3	Implement programs for decision control structures, loops, and arrays.	Apply	Conceptual, Procedural
CO-4	Illustrate concepts of structure, pointer and user defined function.	Apply	Conceptual, Procedural
CO-5	Write programs using graphics and on file handling.	Apply	Procedural, Conceptual

CO – PO/APO Matrix

KCA151:	Programme Outcome (PO)												APO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
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	-

Dr. Sangeeta Arora
(Subject Teacher)

Mr. Prashant Agarwal
(Subject Teacher)

Mr. R N Panda
(Subject Expert)

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DEPARTMENT OF COMPUTER APPLICATIONS (MCA)
KIET GROUP OF INSTITUTIONS, GHAZIABAD

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Computer Organization & Architecture Lab (KCA-152)

Tagging of COs with BLs & KCs

CO No.	Statement of Course Outcome	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
After completion of the course, the student will be able to			
CO1	Examine the output of the basic logic gates for different combinations of input.	Apply	Conceptual
CO2	Demonstrate various combinational circuits for binary arithmetic operations and code converter.	Apply	Conceptual & Procedural
CO3	Illustrate combinational circuits and sequential circuits such as encoders/decoders, multiplexers/de-multiplexers, and flip-flops.	Apply	Conceptual & Procedural
CO4	Implement 2-bit Arithmetic Logic Unit using logic gates and multiplexers.	Apply	Conceptual & Procedural

CO - PO/APO Matrix

Course Code:	Programme Outcome (PO)												APO1	APO2
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	-	-	-	-	2	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	1	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	1	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	1	-	-	-	-	-	-	-
PO Target	3	**2**	-	-	-	-	1.25	-	-	-	-	-	-	-

Subject Teachers

Ms. Shalika

Dr. Shashank Bhardawaj

Mr. Amit Goyal

Subject Expert

Dr. Ajay Kumar Shrivastava

Dr. Ajay Kr. Shrivastava
(Head- CA)

Approved by BoS.

Professional Communication Lab (KCA153)

Tagging COs with BLs & KCs

CO No.	Statement of Course Outcome	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
After completion of the course, the student will be able to			
CO1	Differentiate various situations to communicate effectively for conversation and public speaking.	Analyze	Conceptual & Procedural
CO2	Utilize required voice dynamics to speak effectively for handling various situations at workplace like presentation and official speaking.	Apply	Conceptual & Procedural
CO3	Apply argumentation skills to participate in group discussion and role play.	Apply	Conceptual & Procedural
CO4	Evaluate to summarize topics for thematic presentation and presentation for seminar, workshop, and conference with focus on kinesics.	Evaluate	Conceptual & Procedural
CO5	Develop communicative abilities in all four dimensions of language.	Create	Conceptual, Procedural & Metacognitive

CO-PO-APO Martix

Course Code	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO/ APO -1	PSO/ APO -2
CO-1							3		3		3			
CO-2							3		3		3			
CO-3							3		3		3			
CO-4							3		3		3			
CO-5							3		3		3			
Average (PO Target)							**3**		**3**		**3**			

Dr. Sonia Gaur
(Subject Teacher/Expert)

Dr. Ajay K Shrivastava
(Head-CA)

Approved by BoS

KIET Group of Institutions, Ghaziabad

Department of Computer Applications

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Artificial Intelligence

KCA-301

Tagging COs with BLs & KCs

Course Outcomes (COs)		Bloom's Knowledge Level (BL)	Knowledge Category (KC)
At the end of this course, Student will be able to			
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

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:
Mr. Prashant Agrawal
Ms. Neelam Rawat
Mr. SiddheswahiDutt Mishra

Subject Expert:
Ms. Neelam Rawat
30.09.21

Approved by RD

Dr. Ajay K Shrivastava
(Head-CA)

KIET Group of Institutions, Ghaziabad

Department of Computer Applications

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Software Engineering (KCA-302)

Tagging Cos with BLs & KCs

Course Outcomes (COs)		Bloom's Knowledge Level (BL)	Knowledge Category (KC)
At the end of this course, Student will be able to			
CO-1	**Describe** Software Engineering Concepts and SDLC models.	BL2	F,C,P
CO-2	**Prepare** Software Requirement Specification (SRS) with Modelling tools and Quality standards.	BL3	F,C,P
CO-3	**Analyse** design concepts to software development with software metrics methods.	BL4	F,C,P
CO-4	**Categorize** software testing techniques and its implementation.	BL4	F,C,P
CO-5	**Contrast** Software project management activities with its parameters such as Cost, Efforts, Schedule/ Duration.	BL4	F,C,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
PO Target	3	2.25		1.33		1	2	2	2					1.8

Subject Expert:
Mr. Rabi N. Panda

Subject Teachers:
Ms. Neelam Rawat
Dr. Arun K. Tripathi
Dr. Amit Kumar

Dr. Ajay K Shrivastava
(Head – CA)

Approved by BoS

Computer Networks
(KCA-303)
MCA- Second Year (Third Semester)

Tagging COs with BLs & KCs

CO No.	Statement of Course Outcome	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
After completion of the course, the student will be able to			
CO 1	Describe communication models TCP/IP, ISO-OSI model, network topologies along with communicating devices and connecting media.	BL2	Factual, Conceptual
CO 2	Apply knowledge of error detection, correction and learn concepts of flow control along with error control.	BL3	Conceptual, Procedural
CO 3	Apply IP addressing techniques, subnetting along with network routing protocols and algorithms.	BL3	Conceptual, Procedural
CO 4	Explore transport layer protocols and their layout along with congestion control to maintain Quality of Service.	BL3	Conceptual, Procedural
CO 5	Understand applications-layer protocols and elementary standards of cryptography & network security.	BL2	Factual, Conceptual

CO - PO/APO Matrix

KCA303	Programme Outcome (PO)												APO-1	APO-2
	1	2	3	4	5	6	7	8	9	10	11	12		
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:
1. Dr. Arun Kumar Tripathi
2. Dr. Sangeeta Arora
3. Dr. Vipin Kumar

Subject Expert:
Dr. Arun K. Tripathi

Dr. Ajay Shrivastava
Prof. and Head (CA)

Approved by BoS

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KCA- 021: - Web Technology

Course Objective

On completion of this course, a student will be familiar with web development and web designing using client side and server side scripting programming and able to develop a web application using Java Framework. Students will gain the skills and project-based experience needed for entry into web application and development careers.

Course Outcome

Table 1: Tagging COs with BLs & KCs

CO No.	Statement of Course Outcome	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
After completion of the course, the student will be able to			
CO 1	Construct static web pages using HTML and CSS.	BL3	C,P
CO 2	Develop interactive web page using JavaScript.	BL3	C,P
CO 3	Develop dynamic web applications using servlet and JSP.	BL3	C,P
CO 4	Illustrate Spring-based Java applications using Java configuration, XML configuration, annotation-based configuration, beans and their scopes, and properties.	BL4	C,P
CO 5	Test web services using Spring Boot and REST API	BL5	C,P

Table 2: CO - PO/APO Matrix

KCA303:	Programme Outcome (PO)												APO	APO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
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

Faculty Members:

Dr. Vipin Kumar

Mr. Naresh Chandra

Mr. Ankit Verma

Expert Members:

Dr. Shashank Bhardwaj

Dr. Ajay Kr. Shrivastava
(Head-CA)

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Course Outcome-Program Outcomes (PO) Mapping
Cloud Computing (KCA-014)

Tagging of COs with BLs & KCs

CO No.	Statement of Course Outcome	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
After completion of the course, the student will be able to			
CO1	Illustrate the concepts of Cloud Computing, key technologies, strengths, and limitations of cloud computing.	Apply	Conceptual, Procedural
CO2	Apply cloud computing driven commercial systems such as AWS and other business cloud applications in real life.	Apply	Conceptual, Procedural
CO3	Analyze the knowledge and applications of cloud computing in business, education and in personal.	Analyze	Conceptual, Procedural
CO4	Connect with the concept of virtualization in cloud computing.	Analyze	Conceptual, Procedural
CO5	Discuss the security and privacy issues in cloud computing	Understand	Conceptual

CO - PO/APO Matrix

Course Code:	Programme Outcome (PO)												APO1	APO2
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
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	0	2.6

Amit Goyal
(Subject Teacher)

Shalika
(Subject Teacher)

Vidushi
(Subject Teacher)

Dr. Shashank Bhardwaj
(Subject Expert)

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Artificial Intelligence Lab

KCA-351

Tagging COs with BLs & KCs

Course Outcomes (COs)		Bloom's Knowledge Level (BL)	Knowledge Category (KC)
At the end of this course, Student will be able to			
CO-1	Develop AI Game problems using Python such as Water-Jug and Missionaries-Cannibal	BL3	C,P
CO-2	Analyse AI searching algorithms such as BFS & DFS using python	BL4	C,P
CO-3	Implement Knowledge representation techniques using ~~Pylogs library~~ Pythelog Library	BL3	C,P
CO-4	Demonstrate machine learning algorithms of Classification & Clustering techniques	BL3	C,P

CO-PO/APO Matrix

KCA-351	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
Ms. Neelam Rawat
Mr. SiddheswahiDutt Mishra

Subject Expert:
Ms. Neelam Rawat
30.9.21

Approved by BOS

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Software Engineering Lab (KCA-352)

Session 2020-21

Tagging COs with BLs & KCs

Course Outcomes (COs)		Bloom's Knowledge Level (BL)	Knowledge Category (KC)
At the end of this course, Student will be able to			
CO-1	**Prepare** a SRS document in line with the IEEE recommended standards.	BL3	P,M
CO-2	**Sketch** the graphic representation of various UML diagrams using designing tools.	BL3	P,M
CO-3	**Prepare** test cases for given problem	BL4	P,M

CO-PO/APO Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
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
PO Target	2.33	2.33	2	1	2		3		3		2	3		2.33

Subject Expert:
Mr. Rabi N. Panda

Subject Teachers:
Ms. Neelam Rawat
Dr. Arun K. Tripathi
Dr. Amit Kumar

Dr. Ajay K. Shrivastava
(Head - CA)

Approved by BoS

Mini Project
(KCA353)
MCA- Second Year (Third Semester)

CO	Statement of Course Outcome At the end of course, the student will be able to	Bloom's Cognitive Process Level (BL)	Knowledge Category (KC)
CO1	Demonstrate the software project using life cycle models.	BL-3	C,P
CO2	Plan the SRS document as per project requirements.	BL-4	C,P
CO3	Apply suitable design technique for designing software	BL-3	C,P
CO4	Analyse the project by using a programming language.	BL-4	C,P
CO5	Design report and able to present their work	BL-3	C,P

CO – PO Mapping

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Mini Project (KCA-353)	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

Faculty Members:

Mr. Naresh Chandra

Mr. Ankit Verma

Expert Members:

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COURSE OUTCOME AND MAPPING (MCA-II SEMESTER)

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.	3	C,P
CO2	Implement regular expressions with closure and decision properties.	3	C,P
CO3	Represent the Context Free Languages grammar and its normal forms.	3	C,P
CO4	Design the PDA with deterministic and Nondeterministic properties	4	C,P
CO5	Construct the Universal Turing machine.	4	C,P

Theory of Automata & Formal Languages (KCA-201)														
CO-PO/APO Matrix														
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	APO 1	APO 2
CO1	3	3	–	–	–	–	–	–	–	–	–	–	–	–
CO2	3	3	–	–	–	–	–	–	–	–	–	–	–	–
CO3	3	2	–	–	–	–	–	–	–	–	–	–	–	–
CO4	3	2	–	–	–	–	–	–	–	–	–	–	–	–
CO5	3	3	–	–	–	–	–	–	–	–	–	–	–	–
Target PO	3	3	–	–	–	–	–	–	–	–	–	–	–	–

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COURSE OUTCOME AND MAPPING (MCA-II SEMESTER)

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

Object Oriented Programming (KCA-202)														
CO-PO/APO Matrix														
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	POI 0	POI 1	POI 2	APO 1	APO 2
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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COURSE OUTCOME AND MAPPING (MCA-II SEMESTER)

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 programs in a Java programming environment.	3	C,P
CO-2	Execute Object Oriented Programs using Java programming.	4	C,P
CO-3	Write robust file handling and Object-Oriented Programs with excepting handling approach using Java programming.	3	C,P
CO-4	Construct Object Oriented Programs with multi-threading and generic programming approach using Java programming.	3	C,P
CO-5	Design GUI application with AWT and Swing using Java programming	5	C,P

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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COURSE OUTCOME AND MAPPING (MCA-II SEMESTER)

Operating Systems (KCA-203)			
CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Understand main components, services, types, and structure of Operating Systems.	2	F,C
CO2	Apply various CPU scheduling algorithms for process execution.	3	F,C,P
CO3	Apply the various concurrency control algorithms and techniques to handle various concurrency control issues.	3	F,C,P
CO4	Apply various memory management techniques.	3	F,C,P
CO5	Apply various I/O management, and disk management techniques.	3	F,C,P

Operating Systems (KCA-203)														
CO-PO/APO Matrix														
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	APO 1	APO 2
CO1	2	–	–	–	–	–	2	–	–	–	–	–	–	–
CO2	2	1	–	–	–	–	2	–	–	–	–	–	–	–
CO3	3	2	–	–	–	–	2	–	–	–	–	–	–	–
CO4	2	1	–	–	–	–	2	–	–	–	–	–	–	–
CO5	3	2	–	–	–	–	2	–	–	–	–	–	–	–
Target PO	2.4	1.5	–	–	–	–	2	–	–	–	–	–	–	–

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COURSE OUTCOME AND MAPPING (MCA-II SEMESTER)

Database Management Systems (KCA-204)			
CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Construct overall structure of DBMS, ER Model for efficient Database Design	3	F,C,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	C,P
CO3	Analyze the need of Normalization while classifying any given relation to the desired normal form	4	C,P
CO4	Illustrate the concept of transaction processing and recovery mechanism from various transaction failures	3	C,P
CO5	Classify various concurrency control techniques on different transactions.	3	C,P

Database Management Systems (KCA-204)														
CO-PO/APO Matrix														
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	APO 1	APO 2
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	–	–	–	–	–	–	–
Target PO	2.4	1.8	2	–	2.6	–	1	–	–	–	–	–	2	3

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COURSE OUTCOME AND MAPPING (MCA-II SEMESTER)

DBMS Lab (KCA-252)			
CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC F,C,P,M)
CO1	Illustrate ER models using Case Tools	3	C,P
CO2	Exercise SQL Commands to query a database	3	C,P
CO3	Express PL/SQL programs for implementing stored procedures, stored functions, cursors, triggers and packages	3	C,P

DBMS Lab (KCA-252)														
CO-PO/APO Matrix														
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	APO 1	APO 2
CO1	2	2	–	–	3	–	–	–	–	–	–	–	–	3
CO2	2	2	–	–	3	–	–	–	–	–	–	–	2	3
CO3	–	–	–	–	3	–	2	–	–	–	–	–	2	3
Target PO	2	2	–	–	3	–	2	–	–	–	–	–	2	3

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COURSE OUTCOME AND MAPPING (MCA-II SEMESTER)

Data Structures & Analysis of Algorithms (KCA-205)			
CO	Statement of Course Outcome	BL (1,2,3,4,5,6)	KC (F,C,P,M)
CO1	Demonstrate the concept of types of data structures such as arrays and linked list along with the analysis of algorithms.	3	C,P
CO2	Apply the concept of stack and queue to solve various problem.	3	C,P
CO3	Illustrate the concept of graphs and trees & its applications.	3	C,P
CO4	Compare incremental and divide-and-conquer approaches of designing algorithms for problems such as sorting and searching.	4	C,P
CO5	Analyze various design approaches such as greedy and dynamic programming for solving real life problems.	4	C,P

Data Structures & Analysis of Algorithms (KCA-205)														
CO-PO/APO Matrix														
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO 1	APO 2
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
Target PO	3	3	1.7	–	1.7	–	3	–	–	–	–	–	3	2.2

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COURSE OUTCOME AND MAPPING (MCA-II SEMESTER)

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	Apply various operations on arrays.	3	C,P
CO2	Apply operations of Stacks and Queues using both arrays and linked lists.	3	C,P
CO3	Examine various searching and sorting algorithms.	3	C,P
CO4	Implement graph algorithms to solve the various real-life problems.	3	C,P

Data Structures & Analysis of Algorithms Lab (KCA-253)														
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	APO 1	APO 2
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
Target PO	3	3	–	–	2	–	3	–	–	–	–	–	3	3

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COURSE OUTCOME AND MAPPING (MCA-II SEMESTER)

Cyber Security (KCA-01)			
CO	Statement of Course Outcome	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 countermeasures.	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.	2	C
CO4	Clarify the need of framing the required security policy for safeguarding the Information System under the use.	2	P
CO5	Characterize the legal provisions available in India and internationally for protecting intellectual properties.	2	C

Cyber Security (KCA-01)														
CO-PO/APO Matrix														
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	APO 1	APO 2
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
Target PO	–	–	–	–	–	3	3	–	–	3	–	–	–	3

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