Course Outcome

Session 2024-25 Even Sem

Department of Information Technology

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

- The courses having credits 3 to 6 should have 5 number of Cos. The courses having credits less than 3 should have 4 number of COs.
- The statement of a CO must be formed considering a proper structure having mandatory and optional parts. The mandatory parts are Action & Knowledge and optional parts are Condition and Criteria.

Department of Information Technology

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II Semester		
S No.	**Subject Code**	**Subject Name**
1	MA103L	Linear Algebra for Engineers
2	PH101L	Semiconductor Physics and Devices
3	EE101B	IoT and Embedded System
4	MA202L	Discrete Structures & Theory of Logic
5	CS201B	Data Structure
6	HS101B	Communication Skills
7	ID104B	Innovation and Entrepreneurship
8	PH101P	Semiconductor Physics and Devices Lab
9	EE101P	IoT and Embedded System Lab
10	AI102P	Python for Engineers

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 2nd
Course name: Linear Algebra for Engineers	Course Code: MA103L	Faculty: Dr. Manisha Sharma, Dr.Rashid Ali

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	Apply elementary transformation to solve a system of Linear equations.	**Apply**	Conceptual, Procedural
CO2	Employ the concept of matrix factorization in data decomposition.	**Apply**	Conceptual, Procedural
CO3	Understand the concept of vector space and subspaces.	**Understand**	Conceptual, Procedural
CO4	Explore the concept of linear transformations to apply in engineering applications.	**Apply**	Conceptual, Procedural
CO5	Explore the concept of inner products of vectors to decide orthogonality and orthonormality	**Apply**	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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**
CO-1	3	3	3	-	-	-	-	-	-	-	-	2
CO-2	2	2	3	-	-	-	-	-	-	-	-	1
CO-3	2	2	2	-	-	-	-	-	-	-	-	1
CO-4	2	2	2	-	-	-	-	-	-	-	-	1
CO-5	2	2	2	-	-	-	-	-	-	-	-	1
PO Target	**2.20**	**2.20**	**2.40**									**1.20**

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

- The courses having credits 3 to 6 should have 5 number of Cos. The courses having credits less than 3 should have 4 number of COs.
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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 2nd
Course name : Semiconductor Physics and Devices	Course Code: PH101L	Faculty : Dr. Kapil Kr. Sharma, Dr. Bhagwati Bishnoi, Dr. Soniya Juneja

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	Illustrate the basic concept of crystalline materials and their appropriate use.	Apply	Conceptual, Procedural
CO2	Apply the fundamentals of basic semiconductor Physics on transistors and MOSFET.	Apply	Conceptual, Procedural
CO3	Apply the concepts of semiconductor Physics in aspect of solar cell and Zener diode.	Apply	Conceptual, Procedural
CO4	Implementing of semiconductor Physics to study various characteristics of optoelectronic devices.	Apply	Conceptual, Procedural
CO5	Apply the concept of Quantum Physics to study various phenomenon.	Apply	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)

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		
CO-1	2	1	-	-	-	2	2	-	-	2	-	1	-	1
CO-2	3	2	-	-	-	2	2	-	-	2	-	1	-	1
CO-3	3	2	-	-	-	2	2	-	-	2	-	1	-	1
CO-4	3	2	-	-	-	2	2	-	-	2	-	1	-	1
CO-5	2	1	-	-		-	-	-	-	1	-	1	-	1
PO Target	2.6	1.6				2	2			1.8		1		1

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 2nd
Course name : IoT and Embedded System Lab	Course Code: EE101P	Faculty : Dr. Bandana + Dr. Ankur Maheshwari +Mr. Varun Sharma + Mr. Rajeev Kr + Mr. Ameer Faisal + Dr. Vanya Goel

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	**Understand** the basic concepts of sensors and transducers.	Understand	Conceptual, Procedural
CO2	**Understand** basics of embedded systems and different IoT boards.	Understand	Conceptual, Procedural
CO3	**Apply** basic operations and programming techniques of IoT devices.	Apply	Conceptual, Procedural
CO4	**Apply** smart technology knowledge through case studies.	Apply	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	2	-	-	-	2	2	2	-	-	-	-	2
CO-2	2	-	2	-	2	2	2	-	2	-	-	2
CO-3	3	-	3	2	3	2	2	-	2	-	-	2
CO-4	3	2	3	3	3	2	2	-	2	-	-	2
PO Target	2.5	2	2.66	2.5	2.5	2	2		2			2

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

- The courses having credits 3 to 6 should have 5 number of Cos. The courses having credits less than 3 should have 4 number of COs.
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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 2nd
Course name : Discrete Structures & Theory of Logic	Course Code: MA202L	Faculty : Dr. Garima Bisht + Dr. Richa Aggarwal

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	Acquire knowledge of sets, relations, Poset and lattices to solve ordered structures and their relationship problems	Apply	Conceptual, Procedural
CO2	Apply fundamental concepts of functions and Boolean algebra in logical reasoning and computational abilities.	Apply	Conceptual, Procedural
CO3	Employ the rules of propositions, theory of inferences and predicate logic in logical reasoning problems.	Aply	Conceptual, Procedural
CO4	Understand the concepts of algebraic structures and their applications to apply in critical thinking	Apply	Conceptual, Procedural
CO5	Apply the concept of graph theory in solving shortest path engineering problems	Apply	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	3	3	-	-	2	-	-	1	-	-	-	2
CO-2	3	3	-	2	2	-	-	1	-	-	-	2
CO-3	3	3	-	2	2	-	-	1	-	-	-	2
CO-4	3	3	2	2	2	-	-	1	-	-	-	2
CO-5	3	3	2	2	2	-	-	1	-	-	-	2
PO Target	3	3	2	2	2	-	-	1	-	-	-	2

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 2nd**
Course name : Data Structure	**Course Code: CS201B**	**Faculty : Prof. Dinesh Kumar + Prof. Deepak Vishwakarma + Dr. Sanjeev Kumar**

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	Use the concept of the array in searching and sorting algorithm.	Apply	Conceptual, Procedural
CO2	Illustrate the concept of Dynamic Memory Allocation for Operations on Linked List.	Analyze	Conceptual, Procedural
CO3	Analyze different recursion techniques using stack.	Analyze	Conceptual, Procedural
CO4	Implementation of Queue and its applications using basic data structures.	Apply	Conceptual, Procedural
CO5	Apply the knowledge of tree and binary search tree structures for problem solving.	Apply	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)

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
CO-1	3	1	1	-	1	1	-	-	-	-	-	2
CO-2	3	2	2	1	1	1	-	-	-	-	-	2
CO-3	3	2	2	1	1	1	-	-	-	-	-	2
CO-4	3	2	2	1	1	1	-	-	-	-	-	2
CO-5	3	2	1	1	1	1	-	-	-	-	-	2
PO Target	3	1.8	1.6	1	1	1	-	-	-	-	-	2

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 2nd**
Course name : Communication Skills	**Course Code: HS101B**	**Faculty :** Ms. Ankita Banerjee + Prof. Arunita Mukhopadhyay

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	Understand the essentials of communicating in a professional setting.	understand	conceptual
CO2	Comprehend correct English usage and formal style of listening and speaking.	understand	conceptual
CO3	Apply the usage of verbal and non-verbal cues in presentation and day-to-day communication.	apply	conceptual, procedural
CO4	Develop Communication skills that meet the nature and objectives of the workplace.	apply	conceptual, procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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**
CO-1	-	-	-	-	-	-	-	-	-	3	-	1
CO-2	-	-	-	-	-	-	-	-	-	3	-	1
CO-3	-	-	-	-	-	-	-	-	-	3	-	1
CO-4	-	-	-	-	-	-	-	-	-	3	-	1
CO-5	-	-	-	-	-	-	-	-	-	3	-	1
PO Target	-	-	-	-	-	-	-	-	-	**2.4**	-	**0.8**

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 2nd**
Course name : Innovation and Entrepreneurship	**Course Code: ID104B**	**Faculty : Prof. Anjali Jain + Prof. Minakshi + Prof. Sanjeev Kumar (N)**

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	Demonstrate an understanding of the various types of innovation, their importance in personal and professional growth, and how to apply innovative thinking to solve real-world problems.	3	F,C
CO2	Gain the ability to generate and refine innovative ideas through creative techniques and utilize the Business Model Canvas to structure viable business concepts	3	F,C
CO3	Develop the skills to conduct comprehensive market research, identify and segment target customers, and validate their business ideas based on market insights and data analysis	4	C, P
CO4	Transform their innovative ideas into tangible prototypes (Minimum Viable Products) and will acquire the ability to craft and deliver compelling pitches for potential investors and stakeholders.	4	C, P
CO5	Effectively present their business ideas to industry experts and investors, apply feedback to improve their ideas, and explore opportunities for securing funding or mentorship.	5	P, M

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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**
CO-1	2	2	2	2	1	3	3	2	3	3	3	3
CO-2	2	2	2	2	0	2	2	1	2	2	2	2
CO-3	2	2	2	2	0	2	2	1	3	3	3	3
CO-4	2	1	1	1	2	2	2	2	3	3	3	3
CO-5	1	1	1	1	1	2	2	2	3	3	3	3
PO Target												

Signature of Course Coordinator Minakshi **Signature of Addl. HoD** **Signature of HoD**

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 2nd**
Course name : Semiconductor Physics and Devices Lab	**Course Code: PH101P**	**Faculty : Dr. Kapil Kr. Sharma, Dr. Bhagwati Bishnoi, Dr. Soniya Juneja**

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	Illustrate the basic concept of crystalline materials and their appropriate use.	**Apply**	Conceptual, Procedural
CO2	Apply the fundamentals of basic semiconductor Physics on transistor and MOSFET.	**Apply**	Conceptual, Procedural
CO3	Apply the concepts of semiconductor Physics in aspect of solar cell and Zener diode.	**Apply**	Conceptual, Procedural
CO4	Implementing of semiconductor Physics to study various characteristics of optoelectronic devices.	**Apply**	Conceptual, Procedural
CO5	Apply the concept of Quantum Physics to study various phenomenon.	**Apply**	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)

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		
CO-1	2	1	-	-	-	2	2	-	-	2	-	1	-	1
CO-2	3	2	-	-	-	2	2	-	-	2	-	1	-	1
CO-3	3	2	-	-	-	2	2	-	-	2	-	1	-	1
CO-4	3	2	-	-	-	2	2	-	-	2	-	1	-	1
CO-5	2	1	-	-		-	-	-	-	1	-	1	-	1
PO Target	**2.6**	**1.6**				**2**	**2**			**1.8**		**1**		**1**

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 2nd
Course name : IoT and Embedded System	Course Code: EE101B	Faculty : Dr. Bandana

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	**Understand** the basic concepts of sensors and transducers.	**Understand**	Conceptual, Procedural
CO2	**Understand** the basics of embedded systems and different IoT boards.	**Understand**	Conceptual, Procedural
CO3	**Apply** basic operations and programming techniques of IoT devices.	**Apply**	Conceptual, Procedural
CO4	**Apply** smart technology knowledge through case studies.	**Apply**	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	2	-	-	-	2	2	2	-	-	-	-	2
CO-2	2	-	2	-	2	2	2	-	2	-	-	2
CO-3	3	-	3	2	3	2	2	-	2	-	-	2
CO-4	3	2	3	3	3	2	2	-	2	-	-	2
PO Target	2.5	2	2.66	2.5	2.5	2	2		2			2

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 2nd**
Course name : Python for Engineers	**Course Code: AI102P**	**Faculty : Prof. Dinesh Kumar + Dr. Sanjeev Kumar + Prof. Deepak Vishwakarma + Dr. Surendra Kr. Keshari**

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	Use Python variables, operators, expressions, blocks, and numeric types to solve computational problems.	**Apply**	Procedural
CO2	Apply Python conditional statements, loops, and loop control on real world use cases	**Apply**	Procedural
CO3	Use Python complex data types (strings, lists, tuples, dictionaries) and functions for efficient data manipulation and problem-solving.	**Apply**	Procedural
CO4	Apply Python file operations for reading, writing, manipulating files, and processing structured data efficiently.	**Apply**	Procedural
CO5	Develop simple programs utilizing built-in functions of Python packages like Matplotlib, NumPy, and Pandas.	**Create**	Metacognitive

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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**
CO-1	3	3	2		3				2	2		3
CO-2	3	3	2		3				2	2		3
CO-3	3	3	3	2	3				2	2		3
CO-4	3	3	2	2	3			2	2	2		3
CO-5	3	3	2	2	3			2	2	2		3
PO Target	3	3	2.2	2	3			2	2	2		3

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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IV Semester		
S No.	**Subject Code**	**Subject Name**
1	BAS 403	Maths-IV
2	BAS 401	Technical Communication
3	BCS 402	Theory of Automata & Formal Language
4	BCS 401	Operating System
5	BCS 403	Object Oriented Programming with Java
6	BCC 401	Cyber Security
7	BCS 451	Operating Systems Lab
8	BCS 452	Object Oriented Programming with Java Lab
9	BCS 453	Cyber Security Workshop

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

- The courses having credits 3 to 6 should have 5 number of Cos. The courses having credits less than 3 should have 4 number of COs.
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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 4th
Course name : Maths-IV	Course Code: BAS 403	Faculty : Dr. Deepti Goel

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	Solve partial differential equations by Lagrange, Charpit and other particular methods..	3	C&P
CO2	Apply the method of separation of variables to solve Wave , Heat and Laplace equation. Application of Fourier transform.	3	C&P
CO3	Determine moments, correlation, linear regression lines and obtain best fitting curves to the given data.	3	C&P
CO4	Apply the concept of probability to solve discrete and continuous probability problems.	3	C&P
CO5	Apply the theory of sampling to solve t-test, z-test and Chisquare test problems.	3	C&P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	2	2	-	-	-	-	-	-	-	-	-	2
CO-2	2	2	2	-	-	-	-	-	-	-	-	2
CO-3	2	2	2	2	2	-	-	-	-	-	-	2
CO-4	2	2	1	1	1	-	-	-	-	-	-	1
CO-5	2	1	2	2	2	2	2	-	-	-	-	2
PO Target	2	1.8	1.75	1.6	1.6	2	2	-	-	-	-	1.8

Signature of Course Coordinator

Signature of Addl. HoD

Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 4th**
Course name : Technical Communication	**Course Code: BAS 401**	**Faculty : Ms. Prerna Dhingra Dr. Shradha Shrivastava**

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	UNDERSTAND the nature and objective of Technical Communication relevant for the workplace as Engineers.	**Understand**	F,C
CO2	DEVELOP an understanding of key concepts of writing, designing and speaking.	**Apply**	C,P
CO3	UTILIZE the technical writing skills for the purposes of Technical Communication and its exposure in various dimensions.	**Apply**	C,P
CO4	BUILD UP interpersonal communication traits that will make the transition from institution to workplace smoother and help them to excel in their jobs.	**Apply**	C,P
CO5	APPLY technical communication to build their personal brand and handle crisis communication.	**Apply**	FC

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)

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
CO-1	-	-	-	-	-	-	-	-	3	3	-	-
CO-2	-	-	-	-	-	-	-	-	3	3	-	-
CO-3	-	-	-	-	-	-	-	-	3	3	-	-
CO-4	-	-	-	-	-	-	-	-	3	3	-	-
CO-5	-	-	-	-	-	-	-	-	3	3	-	-
PO Target	-	-	-	-	-	-	-	-	**3**	**3**	-	-

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 4th
Course name : Theory of Automata & Formal Language	Course Code: BCS 402	Faculty : Prof. Minakshi + Prof. Analp Pathak

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	**Understand** basic concepts of automata theory and formal languages.	Understand	C
CO2	**Construct** finite automata for regular expressions and regular languages.	Apply	C, P
CO3	**Illustrate** regular and context-free grammar for formal languages.	Apply	C, P
CO4	**Construct** the pushdown automata for context-free languages.	Apply	C, P
CO5	**Explore** Turing machines for formal languages.	Analyze	C, P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	2	-	-	-	-	-	-	-	-	-	-	1
CO-2	3	2	2	-	-	-	-	-	-	-	-	1
CO-3	3	2	1	-	-	-	-	-	-	-	-	1
CO-4	3	2	2	-	-	-	-	-	-	-	-	1
CO-5	3	3	2	-	-	-	-	-	-	-	-	1
PO Target	2.8	2.25	1.75	-	-	-	-	-	-	-	-	1

Signature of Course Coordinator

Signature of Addl. HoD

Signature of HoD

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 4th
Course name : Operating System	Course Code: BCS 401	Faculty : Prof. Anjali Jain + Dr. Vikas Goel

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	Understand the need, evolution and design issues of various categories of operating systems.	Understand	F,C
CO2	Apply different CPU scheduling algorithms and deadlock handling methods.	Apply	C,P
CO3	Analyze various concurrency issues and different synchronization mechanisms in concurrent execution environment.	Analyze	C,P
CO4	Analyze various memory management techniques for efficient memory allocation.	Analyze	C,P
CO5	Apply different techniques of I/O management, Disk management, Disk scheduling and file system structure in operating systems.	Apply	C,P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	3	2	1	1	1	1	-	-	-	-	-	2
CO-2	3	3	3	3	3	1	-	-	-	-	-	2
CO-3	3	3	2	3	3	2	-	-	-	-	-	2
CO-4	3	3	2	3	3	2	-	-	-	-	-	2
CO-5	3	3	2	2	2	2	-	-	-	-	-	2
PO Target												

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 4th
Course name : Object Oriented Programming with Java	Course Code: BCS 403	Faculty : Prof. Anubha + Prof. Saurabh + Prof. Rajeev Singh

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	Implement Core JAVA concepts that model real world entities.	PO1-PO5, PO12	P
CO2	Implement special features of JAVA like Exception HAndling and Multithreading	PO1-PO5, PO12	P
CO3	Develop Programs based on New JAVA features (JDK 8+)	PO1-PO5, PO12	P
CO4	Apply a collection framework to build modular JAVA programs	PO1-PO5, PO11, PO12	P
CO5	Implement web and restful Web Services with spring boot using Spring Framework Concepts.	PO1-PO5, PO11, PO12	P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	2	3	2	2	2	-	-	-	-	-	-	2
CO-2	2	3	2	2	2	-	-	-	-	-	-	2
CO-3	2	3	2	2	2	-	-	-	-	-	-	3
CO-4	2	2	2	2	3	-	-	-	-	-	2	3
CO-5	2	3	3	3	2	-	-	-	-	-	2	3
PO Target	2	2.8	2.2	2.2	2.2	-	-	-	-	-	2	2.6

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 4th
Course name : Cyber Security	Course Code: BCC 401	Faculty : Dr. Urvashi Chugh

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	Understand the basic concepts and terminology of cyber security and cyber-crimes.	Understand (BL2)	F,C
CO2	Understand the security issues and preventive measures in mobile communication.	Understand (BL2)	C,P
CO3	Apply various cyber attacks along with the tools and methods used in cyber crime	Apply (BL3)	C,P
CO4	Analyse the concepts of cyber forensics and its implication in Social Networking websites	Analyze (BL4)	C,P
CO5	Understand the cyber security policies and cyber laws.	Understand (BL2)	C,P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	2	2	1	1	1	1	-	-	-	-	-	2
CO-2	3	3	3	3	3	1	-	-	-	-	-	2
CO-3	3	3	2	3	3	2	-	-	-	-	-	2
CO-4	3	3	2	3	3	2	-	-	-	-	-	2
CO-5	3	3	2	2	2	2	-	-	-	-	-	2
PO Target	2.8	2.8	2	2.4	2.4	1.6	-	-	-	-	-	2

Signature of Course Coordinator

Signature of Addl. HoD

Signature of HoD

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 4th
Course name : Operating Systems Lab	Course Code: BCS 451	Faculty : Prof. Anjali Jain + Prof. Analp Pathak

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	Implement UNIX system calls for process management and file handling operations.	Apply	Conceptual, Procedural
CO2	Analyze CPU scheduling algorithms, resource utilization techniques, and process synchronization for optimized execution.	Analyze	Procedural
CO3	Implement memory and disk management techniques for efficient system performance.	Apply	Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	3	3	3	3	3	2	-	-	-	1	-	3
CO-2	3	3	2	3	2	2	-	-	-	1	-	3
CO-3	3	3	3	3	3	1	-	-	-	1	-	3
CO-4	3	3	2	3	2	3	-	-	-	1	-	3
CO-5	3	2	2	2	2	3	-	-	-	1	-	3
PO Target												

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 4th
Course name : Object Oriented Programming with Java Lab	Course Code: BCS 452	Faculty : Prof. Anubha + Prof. Jyoti Sharma + Prof. Rajeev Singh

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	Perform core JAVA concepts on an integrated development environment to solve real world problems.	PO1-PO5, PO12, PSO1-PSO2	P
CO2	Apply Exception Handling and multithreading JAVA features in problem solving.	PO1-PO5, PO12, PSO1-PSO2	P
CO3	Solve problems in context of programming code based on New JAVA features (JDK 8+)	PO1-PO5, PO12, PSO1-PSO2	P
CO4	Develop a solution for case study based problem using JAVA collection framework.	PO1-PO5, PO11, PO12,PSO1-PSO2	P
CO5	Design a restful web Services with Spring Boot Test using Spring Framework concepts	PO1-PO5, PO11, PO12,PSO1-PSO2	P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	2	2	2	2	2	-	-	-	-	-	-	2
CO-2	2	2	2	2	2	-	-	-	-	-	-	2
CO-3	2	2	2	2	2	-	-	-	-	-	-	3
CO-4	2	2	2	2	2	-	-	-	-	-	2	2
CO-5	2	2	2	3	2	-	-	-	-	-	2	2
PO Target	2	2	2	2.2	2	-	-	-	-	-	2	2.2

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 4th
Course name : Cyber Security Workshop	Course Code: BCS 453	Faculty : Dr. Urvashi Chugh + Prof. Ayushi + Prof. Parul + Prof. Neha

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	Analyzing network traffic patterns, protocols, and security threats using packet analysis tools such as Wireshark.	Analyze	C,P
CO2	Identifying suspicious activities, malware communication, and potential security threats through the analysis and interpretation of network traffic.	Apply	C, P
CO3	Demonstrate knowledge of common network security vulnerabilities and their exploitation techniques.	Apply	C, P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)

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		
CO-1	3	3	2	1	-	1	1	-	1	-	1	-	2	-
CO-2	3	3	2	1	-	1	1	-	1	-	1	-	2	-
CO-3	2	2	2	2	-	1	1	-	1	-	1	-	1	-
PO Target	2.7	2.7	2	1.3	-	1	1	-	1	-	1	-	1.7	-

Signature of Course Coordinator

Signature of Addl. HoD

Signature of HoD

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2	BIT 601	Data Analytics
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4	BCS 063	Blockchain Architecture Design
5	BOE 068	Software Project Management
6	BNC 602	Essence of Indian Traditional Knowledge
7	BCS 651	SE Lab
8	BIT 651	Data Analytics Lab
9	BCS 653	Computer Networks Lab

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 6th
Course name : Software Engineering	Course Code: BCS 601	Faculty : Dr. Jitendra Kr. Seth + Prof. Parul + Prof. Neha

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	Apply various software characteristics and software development models in software development	Apply	Conceptual
CO2	Apply the content of SRS to develop quality software, meeting the applicable standards.	Apply	Procedural
CO3	Analyze the different approaches to Software design.	Analyze	Procedural
CO4	Apply testing strategy for software systems using methods like functional testing, test driven development and unit testing.	Apply	Procedural
CO5	Analyze various software management methods for development, maintenance and analysis of software.	Analyze	Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	2	2	2	2	1	-	-	-	-	1	1	2
CO-2	2	3	3	3	2	-	-	-	-	2	3	2
CO-3	3	3	3	3	2	-	-	-	-	1	1	2
CO-4	3	3	3	3	2	-	-	-	-	1	2	2
CO-5	2	2	2	3	2	-	-	-	-	1	3	2
PO Target	2.4	2.6	2.6	2.8	1.8	-	-	-	-	1.2	2	2

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 6th
Course name : Data Analytics	Course Code: BIT 601	Faculty : Dr. Sartaj Ahmad + Prof. Ayushi + Prof. Arushi Singh

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	Understand different types of data and their importance in data analytics:	Understand	Conceptual
CO2	Apply advanced statistical techniques to analyze real-world data and extract insights.	Apply	Conceptual,Procedural
CO3	Analyze streaming data to extract real-time insights for decision-making.	Analyze	Conceptual,Procedural
CO4	Evaluate itemset mining and clustering for data patterns.	Evaluate	Conceptual,Procedural
CO5	Develop advanced big data processing and visualization methods for large-scale unstructured data using python	Create	Conceptual,Procedural,Metacognitive

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	1	-	-	-	3	-	-	-	-	-	-	2
CO-2	3	2	1	2	3	-	-	-	3	-	-	3
CO-3	3	3	2	3	3	-	-	-	3	-	2	3
CO-4	3	3	2	3	3	-	-	-	3	-	2	3
CO-5	3	3	3	3	3	-	-	-	3	3	2	3
PO Target	2.6	2.75	2	2.75	3	-	-	-	3	3	2	2.8

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 6th
Course name : Computer Networks	Course Code: BCS 603	Faculty : Dr. Surendra Kr. Keshari + Dr. Veepin Kumar

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	Apply the knowledge of networking concepts and functionality of physical layer.	Apply	C, P
CO2	Explore the concept of elementary data link layer protocol to build a robust network.	Apply	C, P
CO3	Analyze the concept of routing and IP addressing in network layer.	Analyze	C, P
CO4	Examine the usage and working of transport layer.	Analyze	C, P
CO5	Determine the performance of different protocols used at application layer.	Apply	C, P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	3	2	1	1	2	-	-	-	-	-	1	2
CO-2	3	3	1	1	1	-	-	-	-	-	1	2
CO-3	3	2	1	1	2	-	-	-	-	-	3	2
CO-4	3	3	1	1	2	1	-	-	-	-	1	2
CO-5	3	2	1	1	2	2	-	-	-	-	1	2
PO Target	3	2.4	1	1	1.8	1.5	-	-	-	-	1.4	2

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 6th
Course name : Blockchain Architecture Design	Course Code: BCS 063	Faculty : Dr. Mukul Agarwal + Prof. Jyoti Sharma

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	Understand the basics of Blockchain technology along with its primitives.	K2	Factual, Conceptual
CO2	Explain the requirements for basic protocol along with scalability aspects.	K2	Conceptual, Procedural,
CO3	Explore the smart contracts using solidity and hyper-ledger fabric tool	K3	Conceptual, Procedural
CO4	Analyze and Apply Blockchain techniques for different use cases like Finance, Trade/Supply and Government activities.	K4	Conceptual, Procedural,
CO5	Analyze and apply blockchain techniques for different use cases, such as government activities, to provide security.	K4	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Blockchain Architecture Design (BCS 063)

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
CO-1	2	2		1		1	1					1
CO-2	1	2		1		1	1					2
CO-3	1	2		1	2	1	1					1
CO-4	1	2	1	1	1	3	2	2				2
CO-5	1	2	1	1	1	3	2	2				3
PO Target	1.2	2	1	1	1.33	1.8	1.4	2				1.8

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 6th
Course name : Blockchain Architecture Design	Course Code: BCS 063	Faculty : Dr. Mukul Agarwal + Prof. Jyoti Sharma

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	Understand the basics of Blockchain technology along with its primitives.	K2	Factual, Conceptual
CO2	Explain the requirements for basic protocol along with scalability aspects.	K2	Conceptual, Procedural,
CO3	Explore the smart contracts using solidity and hyper-ledger fabric tool	K3	Conceptual, Procedural
CO4	Analyze and Apply Blockchain techniques for different use cases like Finance, Trade/Supply and Government activities.	K4	Conceptual, Procedural,
CO5	Analyze and apply blockchain techniques for different use cases, such as government activities, to provide security.	K4	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Blockchain Architecture Design (BCS 063)

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
CO-1	2	2		1		1	1					1
CO-2	1	2		1		1	1					2
CO-3	1	2		1	2	1	1					1
CO-4	1	2	1	1	1	3	2	2				2
CO-5	1	2	1	1	1	3	2	2				3
PO Target	1.2	2	1	1	1.33	1.8	1.4	2				1.8

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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- The statement of a CO must be formed considering a proper structure having mandatory and optional parts. The mandatory parts are Action & Knowledge and optional parts are Condition and Criteria.

Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 6th**
Course name : Software Project Management	**Course Code: BOE 068**	**Faculty : Prof. Sagar Uniyal + Prof. Malay Kumar**

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	Determine the Cost benefit of the Projects with thorough understanding of project planning activities and the key phases of project management.	**Apply**	Procedural
CO2	Apply different software process models and cost estimation models for development of a project.	**Apply**	Procedural
CO3	Explore various project activities to compute critical path for risk analysis.	**Analyze**	Procedural
CO4	Identify the different project contexts and suggest an appropriate management strategy.	**Analyze**	Procedural
CO5	Adapt professional ethics in staff selection and professional concern in team building for successful software development.	**Apply**	Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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**
CO-1	2	2	-	2	-	-	-	-	-	2	3	2
CO-2	1	2	-	2	-	-	-	-	3	-	3	2
CO-3	2	2	-	2	-	-	-	-	2	-	3	-
CO-4	2	2	-	2	-	-	-	-	3	-	3	-
CO-5	-	-	1	1	-	-	-	2	3	2	-	2
PO Target	1.75	2	1	1.8	-	-	-	2	2.75	2	3	2

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 6th**
Course name : Essence of Indian Traditional Knowledge	**Course Code: BNC 602**	**Faculty : Prof. Neha + Dr. Jitendra Kr. Seth + Prof. Sanjeev Kumar (N)**

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	To understand the roots and details of Society State and Polity in India.	Understand	Factual and Conceptual
CO2	To understand the importance of Indian Literature, Culture, Tradition, Practices and to apply in the present system.	Understand	Factual and Conceptual
CO3	To understand the Indian Religion, Philosophy, Practices and in shadow of Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy and to apply in the present system .	Understand	Factual and Conceptual
CO4	To Understand the Science, Management and Indian Knowledge System and to apply in the present system.	Understand	Factual and Conceptual
CO5	To Understand the Indian Architect, Engineering and Architecture in Ancient India, India's Cultural Contribution to the World and to create an environment in Arts and Cultural for the present system.	Understand	Factual and Conceptual

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)

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
CO-1	-	-	-	-	-	2	-	2	-	-	-	2
CO-2	-	-	-	-	-	2	-	2	-	-	-	2
CO-3	-	-	-	-	-	2	-	1	-	-	-	2
CO-4	1	-	-	-	-	2	2	-	-	-	-	2
CO-5	-	-	-	-	-	2	1	-	-	-	-	2
PO Target	**1**	-	-	-	-	**2**	**1.5**	**2.5**	-	-	-	**2**

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 6th
Course name : Software Engineering Lab	Course Code: BCS 651	Faculty : Dr. Jitendra Kr. Seth + Prof. Anubha + Prof. Neha + Prof. Sherish Johri + Prof. Parul

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	Apply various software characteristics and software development models in software development.	Apply	Conceptual
CO2	Apply the contents of SRS to develop quality software, meeting the applicable standards	Apply	Procedural
CO3	Analyze the different approaches to software design	Analyze	Procedural
CO4	Apply testing strategy for software systems using methods like functional testing, test driven development and unit testing.	Apply	Procedural
CO5	Analyze various software management methods for development, maintenance, and analysis of software.	Analyze	Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	2	2	2	2	1	-	-	-	-	1	1	2
CO-2	2	3	3	3	2	-	-	-	-	2	3	2
CO-3	3	3	3	3	2	-	-	-	-	1	1	2
CO-4	3	3	3	3	2	-	-	-	-	1	2	2
CO-5	2	2	2	3	2	-	-	-	-	1	3	2
PO Target	2.4	2.6	2.6	2.8	1.8	-	-	-	-	1.2	2	2

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 6th**
Course name : Data Analytics Lab	**Course Code: BIT 651**	**Faculty : : Dr. Sartaj Ahmad + Prof. Ayushi + Prof. Arushi Singh**

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	Understand data classification and the importance of analytics, using tools like Python or Weka.	Understand	Conceptual
CO2	Apply data analytics lifecycle, covering preparation, modeling, and result communication across diverse tasks.	Apply	Conceptual,Procedural
CO3	Analyze advanced data analysis techniques like regression, Bayesian methods, and neural networks	Analyze	Conceptual,Procedural
CO4	Explain data stream mining and real-time analytics techniques, including sampling, filtering, and analysis methods.	Evaluate	Conceptual,Procedural
CO5	Develop frequent itemset mining and clustering algorithms.	Create	Conceptual,Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	1	-	-	-	3	-	-	-	-	-	-	2
CO-2	3	2	1	2	3	-	-	-	3	-	-	3
CO-3	3	3	2	3	3	-	-	-	3	-	2	3
CO-4	3	3	2	3	3	-	-	-	3	-	2	3
CO-5	3	3	3	3	3	-	-	-	3	3	2	3
PO Target	2.6	2.75	2	2.75	3	-	-	-	3	3	2	2.8

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 6th**
Course name : Data Analytics Lab	**Course Code: BIT 651**	**Faculty : : Dr. Sartaj Ahmad + Prof. Ayushi + Prof. Arushi Singh**

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	Understand data classification and the importance of analytics, using tools like Python or Weka.	Understand	Conceptual
CO2	Apply data analytics lifecycle, covering preparation, modeling, and result communication across diverse tasks.	Apply	Conceptual,Procedural
CO3	Analyze advanced data analysis techniques like regression, Bayesian methods, and neural networks	Analyze	Conceptual,Procedural
CO4	Explain data stream mining and real-time analytics techniques, including sampling, filtering, and analysis methods.	Evaluate	Conceptual,Procedural
CO5	Develop frequent itemset mining and clustering algorithms.	Create	Conceptual,Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	1	-	-	-	3	-	-	-	-	-	-	2
CO-2	3	2	1	2	3	-	-	-	3	-	-	3
CO-3	3	3	2	3	3	-	-	-	3	-	2	3
CO-4	3	3	2	3	3	-	-	-	3	-	2	3
CO-5	3	3	3	3	3	-	-	-	3	3	2	3
PO Target	2.6	2.75	2	2.75	3	-	-	-	3	3	2	2.8

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 6th
Course name : Computer Networks Lab	Course Code: BCS 653	Faculty : Dr. Surendra Kr. Keshari + Dr. Veepin Kumar + Prof. Sanjeev Kumar (N)

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	Understand the fundamental concepts of computer networking and Network topologies.	Understand	C, P
CO2	Analyze different types of network devices and simple computer networks.	Analyze	C, P
CO3	Implement the basic network commands and use techniques, skills, and modern networking tools necessary for engineering practice.	Analyze	C, P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

(Course Code)

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
CO-1	1	1	1	2	2	-	-	-	-	2	1	2
CO-2	1	2	2	2	1	-	-	2	1	-	1	2
CO-3	1	2	2	-	2	2	1	2	-	2	1	1
PO Target	1	1.6	1.6	2	1.6	2	1	2	1	2	1	1.6

Signature of Course Coordinator

Signature of Addl. HoD

Signature of HoD

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Department of Information Technology

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VIII Semester		
S No.	**Subject Code**	**Subject Name**
1	KHU 801	Rural Development: Administration and Planning
2	KOE 083	Entrepreneurship Development
3	KOE 093	Data Warehousing & Data Mining
4	KIT851	Project

Please Note (Reference: OBE Guidelines wef. Session 2023–24)

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Department of Information Technology

Program Name : B.Tech	**Academic Session : 2024-25**	**Semester: 8th**
Course name : Rural Development: Administration and Planning	**Course Code: KHU 801**	**Faculty Prof. Kamal Kant Sharma + Dr. Vikas Goel**

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	Understand the basic concept of Rural Development.	**Understand**	Conceptual & Procedural
CO2	Understand the various experiments carried out prior to independence for Rural Development.	**Understand**	Conceptual & Procedural
CO3	Apply the procedures of rural administration through Panchayati Raj.	**Apply**	Conceptual & Procedural
CO4	Analyze the need for Human Resource for Rural Development.	**Analyze**	Conceptual & Procedural
CO5	Evaluate the need for Rural Industrialization and Entrepreneurship.	**Evaluate**	Conceptual & Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)

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
CO-1	-	-	-	-	-	2	2	1	-	-	1	2
CO-2	-		-	-	-	1	1	1	-	-	-	1
CO-3	-	-	-	-	-	1	1	2	-	-	-	1
CO-4	-	-	-	-	-	2	3	2	2	-	1	2
CO-5	-	-	-	-	-	2	3	-	2	-	1	2
PO Target						**1.6**	**2**	**1.2**	**2**		**1**	**1.6**

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 8th
Course name : Entrepreneurship Development	Course Code: KOE 083	Faculty : Prof. Sanjeev Kumar + Prof. Anubha

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	Understand the theories of entrepreneurship and Entrepreneurial Development Programs.	2	Factual
CO2	Create innovative business ideas and market opportunities	5	Conceptual, Procedural
CO3	Understand the importance of Project Management and Project's life cycle.	2	Factual, Conceptual
CO4	Understand the importance of Project Management and Project's life cycle	4	Conceptual, Procedural
CO5	Analyze Social Sector Perspectives and Social Entrepreneurship.	4	Conceptual, Procedural

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	-	-	-	-	-	1	1	2	2	-	3	1
CO-2	-	-	-	-	-	2	2	3	3	-	3	2
CO-3	-	-	-	-	-	3	3	2	3	-	3	2
CO-4	-	-	-	-	-	2	3	2	3	-	3	2
CO-5	-	-	-	-	-	2	3	3	2	-	3	3
PO Target	-	-	-	-	-	2	2.4	2.4	2.6	-	3	2

Signature of Course Coordinator Signature of Addl. HoD Signature of HoD

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Department of Information Technology

Program Name : B.Tech	Academic Session : 2024-25	Semester: 8th
Course name : Project	Course Code: KIT 851	Faculty : Prof. Kamal Kant Sharma + Dr. Mukul Agarwal + Prof. Ayushi + Prof. Ila Kaushik + Dr. Jitendra Kr Seth + Dr. Sartaj Ahmad

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	Select and summarize all aspects of the real-life problem through the survey	2	C
CO2	Apply acquired knowledge to develop a working model and plan different phases for its execution.	3	C,P
CO3	Analyze the outcome of each phase using various tools, techniques, and coding practices.	4	C,P
CO4	Justify/defend opinions, validity of ideas or quality of work based on a set of criteria.	5	C,P
CO5	Test the working model and modify related phase accordingly. Finally, integrate all phases	6	C,P

Mapping of Course outcomes with Program outcomes CO-POs Matrix

Course Name (Course Code)												
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
CO-1	3	3	3	3	3	2	1	1	3	3	3	3
CO-2	3	3	3	3	2	2	1	1	3	2	3	3
CO-3	3	3	3	3	2	2	1	1	3	2	3	3
CO-4	3	3	3	3	2	2	1	1	3	2	2	3
CO-5	3	3	3	3	2	2	1	1	3	2	1	2
PO Target	**3**	**3**	**3**	**3**	**2.20**	**2**	**1**	**1**	**3**	**2.20**	**2.40**	**2.80**

Signature of Course Coordinator **Signature of Addl. HoD** **Signature of HoD**

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