Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Calculus for Engineers **Course Code: MA101L** **Course Coordinator Name: Dr. Sachin Kumar**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Apply the concept of partial differentiation in application of homogeneous and composite functions.	PO1, PO2, PO3, PO8, PO12	Apply	C,P
CO2	Apply knowledge of partial differentiation in extrema, series expansion of functions and Jacobians.	PO1, PO2, PO3, PO8, PO12	Apply	C,P
CO3	Construct the transformations using the concept of analyticity and harmonicity of complex functions.	PO1, PO2, PO3, PO8, PO12	Apply	C,P
CO4	Employ the concept of multiple integration to find the area of bounded region.	PO1, PO2, PO3, PO8, PO12	Apply	C,P
CO5	Apply the concept of vector differentials to study the properties of point functions.	PO1, PO2, PO3, PO8, PO12	Apply	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Ekata			
Dr. Kuldeep Sharma			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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 Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Calculus for Engineers **Course Code: MA101L** **Course Coordinator Name: Dr. Sachin Kumar**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2	2	-	-	-	-	1	-	-	-	2	-	-
CO2	2	2	2	-	-	-	-	1	-	-	-	2	-	-
CO3	3	2	2	-	-	-	-	1	-	-	-	1	-	-
CO4	2	2	2	-	-	-	-	1	-	-	-	1	-	-
CO5	3	2	2	-	-	-	-	1	-	-	-	1	-	-
PO Target	**2.4**	**2**	**2**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**1.4**	**-**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Ekata			
Dr. Kuldeep Sharma			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

NIRF-2023
Engineering Rank Band (151-200)
Pharmacy Rank - 88
Innovation Rank Band (51-100)

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Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Semiconductor Physics and Devices **Course Code: PH101L** **Course Coordinator Name: Dr. Dhirendra Kumar Sharma**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Illustrate the basic concept of crystalline materials and their appropriate use.	PO1, PO2, PO6, PO7, PO10, PO12	Understand	C,P
CO2	Apply the fundamentals of basic semiconductor Physics on transistor and MOSFET.	PO1, PO2, PO6, PO7, PO10, PO12	Apply	C,P
CO3	Apply the concepts of semiconductor Physics in aspect of solar cell and Zener diode.	PO1, PO2, PO6, PO7, PO10, PO12	Apply	C,P
CO4	Implementing of semiconductor Physics to study various characteristics of optoelectronic devices.	PO1, PO2, PO6, PO7, PO10, PO12	Apply	C,P
CO5	Apply the concept of Quantum Physics to study various phenomenon.	PO1, PO2, PO10, PO12	Apply	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Vipin Kumar		Dr. Dhirendra Kumar Sharma	
Dr. Kapil Kumar Sharma		Dr. Soniya Juneja	
Dr. Bhagwanti Bishnoi		Dr Deepti Chadhuary	

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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 Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Semiconductor Physics and Devices **Course Code: PH101L** **Course Coordinator Name: Dr. Dhirendra Kumar Sharma**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	1	-	-	-	2	2	-	-	2	-	3		
CO2	3	2	-	-	-	2	2	-	-	2	--	3		
CO3	3	2	-	-	-	2	2	-	-	2	-	3		
CO4	3	2	-	-	-	2	2	-	-	2	-	3		
CO5	2	1	-	-	-	-	-	-	-	1	-	2		
PO Target	2.6	1.6	-	-	-	2	2	-	-	1.8	-	2.8		

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Vipin Kumar		Dr. Dhirendra Kumar Sharma	
Dr. Kapil Kumar Sharma		Dr. Soniya Juneja	
Dr. Bhagwanti Bishnoi		Dr Deepti Chadhuary	

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Programming for Problem Solving **Course Code: IT101B** **Course Coordinator Name: Dr. Anurag Tewari**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Apply programming constructs of C language to solve real-world problems.	PO1, PO2, PO5, PO8, PO12, PSO2	Apply	C,P
CO2	Use the concepts of looping, branching, and decision-making statements for a given problem.	PO1, PO2, PO4, PO5, PO8, PO12, PSO2	Apply	C,P
CO3	Develop Solutions to problems using modular programming constructs such as functions and recursion.	PO1, PO2, PO4, PO5, PO8, PO12, PSO2	Create	C,P,M
CO4	Demonstrate the ability to write C programs using pointers, strings structures and unions.	PO1, PO2, PO3, PO4, PO5, PO8, PO12, PSO2	Apply	C,P
CO5	Design a solution to problems using the concepts of pointers and files handling	PO1, PO2, PO3, PO4, PO5, PO8, PO12, PSO2	Create	C,P,M

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Anurag Tewari			
Dr. Rishabh Jain			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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 Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Programming for Problem Solving **Course Code: IT101B** **Course Coordinator Name: Dr. Anurag Tewari**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	-	-	2	-	-	1	-	-	-	2	-	2
CO2	3	3	-	2	2	-	-	1	-	-	-	2	-	2
CO3	3	3	-	2	2	-	-	1	-	-	-	2	-	2
CO4	3	3	2	2	2	-	-	1	-	-	-	2	-	2
CO5	3	3	2	2	2	-	-	1	-	-	-	2	-	2
PO Target	**3**	**3**	**2**	**2**	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**2**	**-**	**2**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Anurag Tewari			
Dr. Rishabh Jain			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Discrete Structures & Theory of Logic **Course Code: MA202L** **Course Coordinator Name:** Dr. Deepti Seth

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Acquire knowledge of sets, relations, Poset and lattices to solve ordered structures and their relationship problems.	PO1, PO2, PO3, PO8, PO12	Apply	C,P
CO2	Apply fundamental concepts of functions and Boolean algebra in logical reasoning and computational abilities.	PO1, PO2, PO3, PO8, PO12	Apply	C,P
CO3	Employ the rules of propositions, theory of inferences and predicate logic in logical reasoning problems.	PO1, PO2, PO3, PO8, PO12	Apply	C,P
CO4	Understand the concepts of algebraic structures and their applications to apply in critical thinking.	PO1, PO2, PO3, PO8, PO12	Apply	C,P
CO5	Apply the concept of graph theory in solving shortest path engineering problems	PO1, PO2, PO3, PO8, PO12	Apply	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Sanjay Garg		Dr. Richa Agarwal	

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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 Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Discrete Structures & Theory of Logic **Course Code: MA202L** **Course Coordinator Name:** Dr. Deepti Seth

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	-	-	2	-	-	1	-	-	-	2	-	2
CO2	3	3	-	2	2	-	-	1	-	-	-	2	-	2
CO3	3	3	-	2	2	-	-	1	-	-	-	2	-	2
CO4	3	3	2	2	2	-	-	1	-	-	-	2	-	2
CO5	3	3	2	2	2	-	-	1	-	-	-	2	-	2
PO Target	**3**	**3**	**2**	**2**	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**2**	**-**	**2**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Sanjay Garg		Dr. Richa Agarwal	

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: IoT and Embedded Systems **Course Code: K24EEE11** **Course Coordinator Name: Prof. Salim**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the basic concepts of sensors and transducers.	PO1, PO5, PO6, PO7, PO12, PSO-2	Understand	C, P
CO2	Understand the basics of embedded systems and different IoT boards.	PO1, PO3, PO5, PO6, PO7, PO9, PO12, PSO-2	Understand	C, P
CO3	Apply basic operations and programming techniques of IoT devices.	PO1, PO3, PO4, PO5, PO6, PO7, PO9, PO12, PSO-2	Apply	C, P
CO4	Apply smart technology knowledge through case studies.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO12, PSO2	Apply	C, P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Bandana			
Dr. Ankur Maheshwari			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: IoT and Embedded Systems **Course Code: K24EEE11** **Course Coordinator Name: Prof. Salim**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	-	-	-	2	2	2	-	-	-	-	2	-	2
CO2	2	-	2	-	2	2	2	-	2	-	-	2	-	2
CO3	3	-	3	2	3	2	2	-	2	-	-	2	-	3
CO4	3	2	3	3	3	2	2	-	2	-	-	2	-	3
PO Target	2.5	2	2.66	2.5	2.5	2	2	-	2	-	-	2	-	2.5

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Bandana			
Dr. Ankur Maheshwari			

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Design Thinking **Course Code: ID103B** **Course Coordinator Name: Dr. Gaurav Dubey**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the basic requirements of a good design.	PO1, PO2, PO3, PO6, PO9, PO10, PO12, PSO1	2	C
CO2	Empathise and ideate the solutions to problems in his environment	PO1, PO2, PO3, PO6, PO9, PO10, PO12, PSO1	3	C, P
CO3	Prototype and test the developed solutions.	PO1, PO2, PO3, PO6, PO9, PO10, PO12, PSO1	3	C, P
CO4	Apply the principles of design thinking on developing innovative solutions to the real world problems.	PO1, PO2, PO3, PO6, PO9, PO10, PO12, PSO1	3	C, P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Gaurav Dubey		Dr. Anurag Mishra	
Dr. Akash Punhani		Dr. Harsh Khatter	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 number of COs.
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Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Design Thinking **Course Code: ID103B** **Course Coordinator Name: Dr. Gaurav Dubey**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	2	3	2	-	1	-	-	2	2	-	2	1	-
CO2	1	2	3	2	-	1	-	-	2	2	-	2	1	-
CO3	1	2	3	2	-	1	-	-	2	2	-	2	1	-
CO4	1	2	3	2	-	1	-	-	2	2	-	2	1	-
PO Target	**1**	**2**	**3**	**2**	**-**	**1**	**-**	**-**	**2**	**2**	**-**	**2**	**1**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Gaurav Dubey		Dr. Anurag Mishra	
Dr. Akash Punhani		Dr. Harsh Khatter	

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Semiconductor Physics and Devices **Course Code: PH101L** **Course Coordinator Name: Dr. Dhirendra Kumar Sharma**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Illustrate the basic concept of crystalline materials and their appropriate use.	PO1, PO2, PO6, PO7, PO10, PO12	Understand	C,P
CO2	Apply the fundamentals of basic semiconductor Physics on transistor and MOSFET.	PO1, PO2, PO6, PO7, PO10, PO12	Apply	C,P
CO3	Apply the concepts of semiconductor Physics in aspect of solar cell and Zener diode.	PO1, PO2, PO6, PO7, PO10, PO12	Apply	C,P
CO4	Implementing of semiconductor Physics to study various characteristics of optoelectronic devices.	PO1, PO2, PO6, PO7, PO10, PO12	Apply	C,P
CO5	Apply the concept of Quantum Physics to study various phenomenon.	PO1, PO2, PO10, PO12	Apply	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Vipin Kumar		Dr. Dhirendra Kumar Sharma	
Dr. Kapil Kumar Sharma		Dr. Soniya Juneja	
Dr. Bhagwanti Bishnoi		Dr Deepti Chadhuary	

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Semiconductor Physics and Devices **Course Code: PH101L** **Course Coordinator Name: Dr. Dhirendra Kumar Sharma**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	1	-	-	-	2	2	-	-	2	-	3	-	-
CO2	3	2	-	-	-	2	2	-	-	2	--	3	--	--
CO3	3	2	-	-	-	2	2	-	-	2	-	3	-	-
CO4	3	2	-	-	-	2	2	-	-	2	-	3	-	-
CO5	2	1	-	-	-	-	-	-	-	1	-	2	-	-
PO Target	**2.6**	**1.6**	-	**-**	**-**	**2**	**2**	**-**	**-**	**1.8**	**-**	**2.8**	**-**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Vipin Kumar		Dr. Dhirendra Kumar Sharma	
Dr. Kapil Kumar Sharma		Dr. Soniya Juneja	
Dr. Bhagwanti Bishnoi		Dr Deepti Chadhuary	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Programming for Problem Solving **Course Code: IT101B** **Course Coordinator Name: Dr. Anurag Tewari**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Apply programming constructs of C language to solve real-world problems.	PO1, PO2, PO5, PO8, PO12, PSO2	Apply	C,P
CO2	Use the concepts of looping, branching, and decision-making statements for a given problem.	PO1, PO2, PO4, PO5, PO8, PO12, PSO2	Apply	C,P
CO3	Develop Solutions to problems using modular programming constructs such as functions and recursion.	PO1, PO2, PO4, PO5, PO8, PO12, PSO2	Create	C,P,M
CO4	Demonstrate the ability to write C programs using pointers, strings structures and unions.	PO1, PO2, PO3, PO4, PO5, PO8, PO12, PSO2	Apply	C,P
CO5	Design a solution to problems using the concepts of pointers and files handling	PO1, PO2, PO3, PO4, PO5, PO8, PO12, PSO2	Create	C,P,M

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Anurag Tewari			
Dr. Rishabh Jain			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 number of COs.
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Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Programming for Problem Solving **Course Code: IT101B** **Course Coordinator Name: Dr. Anurag Tewari**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	-	-	2	-	-	1	-	-	-	2	-	2
CO2	3	3	-	2	2	-	-	1	-	-	-	2	-	2
CO3	3	3	-	2	2	-	-	1	-	-	-	2	-	2
CO4	3	3	2	2	2	-	-	1	-	-	-	2	-	2
CO5	3	3	2	2	2	-	-	1	-	-	-	2	-	2
PO Target	**3**	**3**	**2**	**2**	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**2**	**-**	**2**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Anurag Tewari			
Dr. Rishabh Jain			

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: IoT and Embedded Systems Lab **Course Code: EE101P** **Course Coordinator Name: Prof. Salim**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the basic concepts of sensors and transducers.	PO1, PO5, PO6, PO7, PO12, PSO-2	Understand	C, P
CO2	Understand basics of embedded system and different IoT boards.	PO1, PO3, PO5, PO6, PO7, PO9, PO12, PSO-2	Understand	C, P
CO3	Apply basic operations and programming techniques of IoT devices.	PO1, PO3, PO4, PO5, PO6, PO7, PO9, PO12, PSO2	Apply	C, P
CO4	Apply smart technology knowledge through case studies.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO12, PSO-2	Apply	C, P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Bandana			
Dr. Ankur Maheshwari			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: IoT and Embedded Systems Lab **Course Code: EE101P** **Course Coordinator Name: Prof. Salim**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	-	-	-	2	2	2	-	-	-	-	2	-	2
CO2	2	-	2	-	2	2	2	-	2	-	-	2	-	2
CO3	3	-	3	2	3	2	2	-	2	-	-	2	-	3
CO4	3	2	3	3	3	2	2	-	2	-	-	2	-	3
PO Target	**2.5**	**2**	**2.66**	**2.5**	**2.5**	**2**	**2**	**-**	**2**	**-**	**-**	**2**	**-**	**2.5**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Bandana			
Dr. Ankur Maheshwari			

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Web Designing **Course Code: IT102B** **Course Coordinator Name: Dr. Deepti Seth**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Acquire knowledge of sets, relations, Poset and lattices to solve ordered structures and their relationship problems	PO1, PO2, PO3, PO8, PO12	3	C,P
CO2	Apply fundamental concepts of functions and Boolean algebra in logical reasoning and computational abilities.	PO1, PO2, PO3, PO8, PO12	3	C,P
CO3	Employ the rules of propositions, theory of inferences and predicate logic in logical reasoning problems.	PO1, PO2, PO3, PO8, PO12	3	C,P
CO4	Understand the concepts of algebraic structures and their applications to apply in critical thinking	PO1, PO2, PO3, PO8, PO12	3	C,P
CO5	Apply the concept of graph theory in solving shortest path engineering problems.	PO1, PO2, PO3, PO8, PO12	3	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Sanjay Garg			
Dr. Richa Agarwal			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Web Designing **Course Code: IT102B** **Course Coordinator Name: Dr. Deepti Seth**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	-	-	2	-	-	1	-	-	-	2	-	2
CO2	3	3	-	2	2	-	-	1	-	-	-	2	-	2
CO3	3	3	-	2	2	-	-	1	-	-	-	2	-	2
CO4	3	3	2	2	2	-	-	1	-	-	-	2	-	2
CO5	3	3	2	2	2	-	-	1	-	-	-	2	-	2
PO Target	**3**	**3**	**2**	**2**	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**2**	**-**	**2**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Sanjay Garg			
Dr. Richa Agarwal			

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Communication Skills **Course Code: HS101B** **Course Coordinator Name:** Dr. Priyanka Sharma

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the essentials of communicating in a professional setting.	PO10, PO12	Understand	C
CO2	Understand the essentials of communicating in a professional setting.	PO10, PO12	Understand	C
CO3	Apply the usage of verbal and non-verbal cues in presentation andday-to-day communication.	PO10, PO12	Apply	C,P
CO4	Develop Communication skills that meet the nature and objectives of the workplace.	PO10, PO12	Apply	C,P
CO5	Understand the essentials of communicating in a professional setting.	PO10, PO12	Understand	C

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Priyanka Sharma			
Dr. Soniya Verma			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: Communication Skills **Course Code: HS101B** **Course Coordinator Name:** Dr. Priyanka Sharma

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO2	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO4	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO5	-	-	-	-	-	-	-	-	-	3	-	1	-	-
PO Target	-	-	-	-	-	-	-	-	-	3	-	1	-	-

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Priyanka Sharma			
Dr. Soniya Verma			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Engineering Science Course-Sensor **Course Code: BOE305** **Course Coordinator Name: Dr. Rahat Ullah Khan**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Able to understand the use of sensors for measurement of displacement, force and pressure.	PO1, PO2, PO3, PO4, PO11, PSO1 PSO2	Understand	C,P
CO2	Able to understand the uses of sensors in industry for measurement of temperature, position, accelerometer, vibration sensor, flow and level.	PO1, PO2, PO3, PO4, PO5, PO9, PO11, PSO1, PSO2	Understand	C,P
CO3	Able to apply the concept of virtual instrumentation in automation industries.	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2	Apply	F,P
CO4	Able to understand , Identify and use data acquisition methods.	PO1, PO2, PO3, PO4, PO5, PO6,PO5, PSO2	Understand	C,P
CO5	Able to comprise intelligent instrumentation in industrial automation.	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2	Understand	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Rahat Ullah Khan		Dr. Deepti	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year:2nd** **Semester: 3rd**

Course Name: Engineering Science Course-Sensor **Course Code: BOE305** **Course Coordinator Name: Dr. Rahat Ullah Khan**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	2	2	2	-	-	-	-	-	-	2	-	3	2
CO2	3	3	2	3	2	-	-	-	-	-	3	-	2	2
CO3	3	2	2	3	3	3	-	-	-	-	2	-	2	2
CO4	2	3	2	2	2	3	2	-	-	-	3	-	2	2
CO5	2	2	2	2	2	2	-	-	-	-	2	-	2	2
PO Target	**2.60**	**2.40**	**2.00**	**2.40**	**2.25**	**2.67**	**2.00**	**-**	**-**	**-**	**2.40**	**-**	**2.20**	**2.00**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Rahat Ullah Khan		Dr. Deepti	

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Universal Human Values & Professional Ethics Course Code:BVE301 Course Coordinator Name: Prof. Pawan Kumar Pal

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Articulate the significance of value, skill, happiness, prosperity and the process of value education.	PO6,PO7,PO8,PO9, PO12	Understand	C,P
CO2	Explore the concept of harmony in the human being (in Myself) being 'I' & 'body' as separate entity and their coexistence.	PO6,PO7,PO8,PO9, PO12	Apply	C,P
CO3	Interpret the process of developing harmony in family, society and in universal order.	PO6,PO7,PO8,PO9, PO12	Understand	C,P
CO4	Express the process of developing harmony in nature as self-organizing unit and in its coexistence.	PO6,PO7,PO8,PO9, PO12	Understand	C,P
CO5	Analyze ethical, unethical practices and strategy in larger order based on case studies.	PO6,PO7,PO8,PO9, PO12	Analyze	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Pawan Kumar Pal		Prof. Akash Goel	
Prof. Arti Sharma			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Universal Human Values & Professional Ethics Course Code:BVE301 Course Coordinator Name: Prof. Pawan Kumar Pal

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	1	2	3	-	-	2	-	-
CO2	-	-	-	-	-	3	1	2	3	-	-	2	-	-
CO3	-	-	-	-	-	3	1	2	3	-	-	3	-	-
CO4	-	-	-	-	-	2	3	2	2	-	-	3	-	-
CO5	-	-	-	-	-	2	3	3	2	-	-	3	-	-
PO Target	-	-	-	-	-	2.6	1.8	2.6	2.6	-	-	2.6	-	-

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Pawan Kumar Pal		Prof. Akash Goel	
Prof. Arti Sharma			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Python Programming **Course Code: BCC302** **Course Coordinator Name: Prof. Bhagvan Krishna Gupta**

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the fundamentals of Python syntax, semantics and Programming.	PO1, PO2, PSO1	Understand	C
CO2	Acquire proficiency in the handling of strings and functions and be fluent in the use of Python control flow statements.	PO1, PO2, PO3, PO4,PO12, PSO1	Apply	C, P
CO3	Determine the methods for ease of user to write python programs by utilizing the data structures like lists, dictionaries, tuples and sets.	PO1, PO2, PO3, PO4,PO12, PSO1, PSO2	Apply	C, P
CO4	Interpret the commonly used operations involving in file systems.	PO1, PO2, PO3, PO4,PO12, PSO1, PSO2	Understand	F, C
CO5	Explain and use of different in-built function of packages and connecting with GUI programming.	PO1, PO2, PO3, PO4,PO12, PSO1, PSO2	Apply	C, P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Bhagvan Krishna Gupta		Prof. Arti Sharma	
Prof. Umnah		Prof. Akanksha Morale	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 number of COs.
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Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Python Programming **Course Code: BCC302** **Course Coordinator Name: Prof. Bhagvan Krishna Gupta**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO2	2	2	1	1	-	-	-	-	-	-	-	2	2	-
CO3	3	2	1	1	-	-	-	-	-	-	-	2	2	1
CO4	2	2	2	1	-	-	-	-	-	-	-	2	2	1
CO5	3	3	2	1	-	-	-	-	-	-	-	2	2	1
PO Target	**2.4**	**2**	**1.5**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1.8**	**1**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Bhagvan Krishna Gupta		Prof. Arti Sharma	
Prof. Umnah		Prof. Akanksha Morale	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Data Structure **Course Code: BCS301** **Course Coordinator Name: Dr. Harsh Khatter**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Apply the concepts of Array and Linked List in problem solving.	PO1, PO2, PO3, PO4, PO12, PSO1	Apply	C,P
CO2	Implement the working of abstract data types like Stack and Queue to solve scenario-based problems.	PO1, PO2, PO3, PO4, PO12, PSO1	Apply	C,P
CO3	Examine the working of various Searching and Sorting algorithms on scenario-based problems in terms of complexity.	PO1, PO2, PO3, PO4, PO12, PSO1	Apply	C,P
CO4	Examine the various types of Tree data structure in terms of data storage, memory utilization, data representation, and optimization.	PO1, PO2, PO3, PO4, PO12, PSO1	Apply	C,P
CO5	Examine the problem statements in terms of Graphs to solve the real-world problems in an easy manner.	PO1, PO2, PO3, PO4, PO12, PSO1	Apply	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Harsh Khatter		Prof. Sreesh Gaur	
Prof. Anurag Mishra		Prof. Puneet Kumar Goyal	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Data Structure **Course Code: BCS301** **Course Coordinator Name: Dr. Harsh Khatter**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	2	1	-	-	-	-	-	-	-	3	3	-
CO2	3	3	3	2	-	-	-	-	-	-	-	3	3	-
CO3	3	3	3	2	-	-	-	-	-	-	-	3	3	-
CO4	3	3	2	2	-	-	-	-	-	-	-	3	3	-
CO5	3	3	2	2	-	-	-	-	-	-	-	3	3	-
PO Target	3	3	2.4	1.8	-	-	-	-	-	-	-	3	3	-

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Harsh Khatter		Prof. Sreesh Gaur	
Prof. Anurag Mishra		Prof. Puneet Kumar Goyal	

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Computer Organization and Architecture **Course Code:BCS302** **Course Coordinator Name: Dr. Kalpna Sagar**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Describe the basic organization and operation of the components of a digital computer system.	PO1, PO2, PO3, PO4, PO12, PSO1	Apply	C,P
CO2	Illustrate various arithmetic and logical operations on different types of numbers to design an arithmetic and logic unit.	PO1, PO2, PO3, PO4, PO12, PSO1	Analyze	C,P
CO3	Analyze the performance issues of the processor and classify the control unit implementation techniques.	PO1, PO2, PO3, PO4, PO12, PSO1, PSO2	Analyze	C,P
CO4	Categorize the hierarchical memory system and examine the virtual memory implementation techniques.	PO1, PO2, PO3, PO4, PO12, PSO1, PSO2	Analyze	C,P
CO5	Compare the different I/O data transfer techniques, and describe the different ways of communication among I/O devices and standard I/O interfaces.	PO1, PO2, PO3, PO4, PO12, PSO1, PSO2	Analyze	C,P

Faculty Members Teaching the Course		Signature	Faculty Members Teaching the Course	
Dr. Kalpna Sagar		Prof. Shreela Pareek		
Prof. Amit Kumar Singh Sanger		Prof. Akash Goel		

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Computer Organization and Architecture **Course Code:BCS302** **Course Coordinator Name: Dr. Kalpna Sagar**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2	1	1	-	-	-	-	-	-	-	1	1	-
CO2	3	2	2	1	-	-	-	-	-	-	-	1	1	-
CO3	3	2	2	1	-	-	-	-	-	-	-	1	2	1
CO4	2	2	2	1	-	-	-	-	-	-	-	1	1	1
CO5	3	2	2	1	-	-	-	-	-	-	-	1	1	1
PO Target	**2.6**	**2**	**1.8**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1.2**	**1**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Kalpna Sagar		Prof. Shreela Pareek	
Prof. Amit Kumar Singh Sanger		Prof. Akash Goel	

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year:2nd** **Semester: 3rd**

Course Name: DSTL **Course Code: BCS303** **Course Coordinator Name: Prof. Vandana**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Acquire Knowledge of sets and relations for solving problems of POSET and lattices.	PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2	Apply	C,P
CO2	Apply fundamental concepts of functions and Boolean algebra for solving the problems of logical abilities.	PO1, PO2, PO3, PO5, PO7, PSO1	Apply	C,P
CO3	Employ the rules of propositions and predicate logic to solve the complex and logical problems.	PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2	Apply	F,C,P
CO4	Explore the concepts of group theory and their applications for solving the advance technological problems.	PO1, PO2, PO3, PO5, PO7, PSO1, PSO2	Analyze	C,P
CO5	Illustrate the principles and concepts of graph theory for solving problems related to computer science.	PO1, PO2, PO3, PO5, PO7, PSO1, PSO2	Analyze	F,C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Vandana		Prof. Kuldeep Kumar Atariya	
Prof. Neha Shukla			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**
Course Name: DSTL **Course Code: BCS303** **Course Coordinator Name: Prof. Vandana**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	1	1	1	1	-	-	-	-	-	-	1	3	2
CO2	3	1	1	-	2	-	-	-	-	-	-	1	2	-
CO3	3	1	1	2	2	-	-	-	-	-	-	1	3	1
CO4	3	2	1	-	1	-	-	-	-	-	-	1	2	1
CO5	3	3	2	-	2	-	-	-	-	-	-	2	2	1
PO Target	**3**	**1.6**	**1.2**	**1.5**	**1.6**	**-**	**-**	**-**	**-**	**-**	**-**	**1.2**	**2.4**	**1**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Vandana		Prof. Kuldeep Kumar Atariya	
Prof. Neha Shukla			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year:2nd** **Semester: 3rd**

Course Name: Data Structures Lab **Course Code: BCS351** **Course Coordinator Name: Prof. Anurag Mishra**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Perform the primitive operation on various types of data structures	PO1,PO2,PO3,PO12, PSO1	Apply	C,P
CO2	Apply the concepts of data structure in problem solving.	PO1,PO2,PO3,PO12, PSO1	Apply	C,P
CO3	Make a solution for the scenario-based problems in terms of algorithm and programming code on competitive platforProf.	PO1,PO2,PO3,PO12, PSO1	Analyse	C,P
CO4	Design a solution for a project-based problem as a team and present the solution in class	PO1,PO2,PO3,PO9, PO10,PO11,PO12, PSO1	Create	P,M

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. AnuragMishra		Prof. Sreesh Gaur	
Dr. Harsh Khatter		Prof. Puneet Kumar Goyal	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session:** 2024-25 **Year:** 2nd **Semester:** 3rd

Course Name: Data Structure Lab **Course Code:** BCS351 **Course Coordinator Name:** Prof. Anurag Mishra

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	1	2	-	-	-	-	-	-	-	-	2	3	-
CO2	3	3	3	-	-	-	-	-	-	-	-	2	3	-
CO3	3	3	3	-	-	-	-	-	-	-	-	2	3	-
CO4	3	3	3	-	-	-	-	-	2	2	1	1	3	-
PO Target	**2.75**	**2.5**	**2.75**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**1**	**1.75**	**3**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. AnuragMishra		Prof. Sreesh Gaur	
Dr. Harsh Khatter		Prof. Puneet Kumar Goyal	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester:3rd**

Course Name: COA Lab **Course Code: BCS352** **Course Coordinator Name: Prof. Akash Goel**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Examine the output of the basic logic gates for different combinations of inputs.	PO1, PO2, PO3,PO4, PO5, PO9, PO10	Apply	P
CO2	Design the combinational circuits for binary arithmetic (such as adders, subtractors, and multiplier) and code converter.	PO1, PO2, PO3,PO4, PO5, PO9, PO10, PO12	Evaluate	P
CO3	Design the combinational circuits for encoders/decoders and selection devices multiplexers/demultiplexers using logic gates.	PO1, PO2, PO3,PO4, PO5, PO9, PO10, PO12, PSO1, PSO2	Evaluate	P
CO4	Design the basic building block of the sequential circuits (i.e., SR and D Flip Flops) using logic gates.	PO1, PO2, PO3,PO4, PO5, PO9, PO10, PO12, PSO1, PSO2	Evaluate	P
CO5	Design the 2-bit Arithmetic Logic Unit using logic gates.	PO1, PO2, PO3,PO4, PO5, PO9, PO10, PO12, PSO1, PSO2	Evaluate	P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Kalpna Sagar		Prof. Shreela Pareek	
Prof. Amit Kumar Singh Sanger		Prof. Akash Goel	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**
Course Name: COA Lab **Course Code:BCS352** **Course Coordinator Name: Prof. Akash Goel**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2	2	1	1	-	-	-	1	1	-	-	3	2
CO2	3	3	3	2	1	-	-	-	1	1	-	1	3	3
CO3	2	3	3	2	1	-	-	-	1	1	-	1	3	3
CO4	2	3	3	2	1	-	-	-	1	1	-	1	3	3
CO5	2	3	3	2	1	-	-	-	1	1	-	1	3	3
PO Target	**2.2**	**2.8**	**2.8**	**1.8**	**1**	**-**	**-**	**-**	**1**	**1**	**-**	**1**	**3**	**2.8**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Kalpna Sagar		Prof. Shreela Pareek	
Prof. Amit Kumar Singh Sanger		Prof. Akash Goel	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD'

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**

Course Name: Web Design Workshop **Course Code: BCS353** **Course Coordinator Name: Prof. Kuldeep Kumar Atariya**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Implement HTML tags for designing web application.	PO1,PO3,PSO1,PSO2	Apply	P
CO2	Implement Cascading Style Sheet (CSS) to improve look and feel of web application.	PO1,PO3,PSO1,PSO2	Apply	P
CO3	Implement bootstrap components to design dynamic web application.	PO1, PO2, PO3, PO5,PO12, PSO1,PSO2	Apply	P
CO4	Apply the principles and methods of Java Script on real world web application.	PO1, PO2, PO3, PO5,PO12, PSO1, PSO2	Apply	P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Kuldeep Kumar Atariya		Prof. Vivek Kumar Sharma	
Prof. Abhishek Goyal			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator Assoc./ Asst. Head DOC Signature of Addl. HoD Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2nd** **Semester: 3rd**
Course Name: Web Design Workshop **Course Code: BCS353** **Course Coordinator Name: Prof. Kuldeep Kumar Atariya**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	-	2	-	-	-	-	-	-	-	-	-	1	1
CO2	1	-	2	-	-	-	-	-	-	-	-	-	1	1
CO3	1	2	3	-	3	-	-	-	-	-	-	2	2	2
CO4	1	2	3	-	2	-	-	-	-	-	-	2	2	2
PO Target	**1**	**2**	**2.5**	**-**	**1.25**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1.75**	**1.5**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Kuldeep Kumar Atariya		Prof. Vivek Kumar Sharma	
Prof. Abhishek Goyal			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**

Course Name: DBMS **Course Code: BCS 501** **Course Coordinator Name: Dr. Gaurav Dubey**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Apply database knowledge to design solutions for real-life problems	PO2,PO3,PO4PO5, PO9,PO10,PO11PO12, PSO1	Apply	C,P
CO2	Apply query processing techniques using SQL and PL/SQL to automate the real time problems of databases.	PO1, PO2,PO3 PO4, PO5,PO9,PO10 PO12,	Apply	C,P
CO3	Solve the redundancy problem in database tables using normalization.	PO1, PO2,PO3 PO4, PO12,	Create	C,P
CO4	Understand the concepts of transactions and recovery schemes.	PO1, PO2, PO3, PO4, PO5, PO6, PO12, PSO1	Apply	C,P
CO5	Understand the concepts of concurrency control techniques.	PO1, PO2, PO3, PO4, PO5,PO6,PO11, PO12, PSO1	Understand	F,C

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Ajay Kumar Shrivastava		Prof. Arushi Gupta	
Dr. Gaurav Dubey			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session:** 2024-25 **Year:**3rd **Semester:** 5th
Course Name: DBMS **Course Code:** BCS501 **Course Coordinator Name:** Dr. Gaurav Dubey

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	3	3	2	-	-	-	2	2	2	3	3	-
CO2	3	2	3	2	3	-	-	-	-	-	-	3	-	-
CO3	3	2	3	2	2	1	-	-	2	3	-	3	-	-
CO4	3	3	3	2	3	2	1	1	-	-	-	3	3	-
CO5	3	3	3	2	3	2	1	1	-	-	-	3	3	-
PO Target	3	2.4	3	2.2	2.6	1.66	1	1	2	2.5	2	3	3	-

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Ajay Kumar Shrivastava		Prof. Arushi Gupta	
Dr. Gaurav Dubey			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
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Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**

Course Name: Web Technology **Course Code: BCS502** **Course Coordinator Name: Dr. Abhishek Goyal**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the fundamentals of web development with HTML and XML.	PO1, PO2, PO3, PO4, PO12	Understand	F,C
CO2	Apply CSS to design responsive web applications.	PO1, PO2, PO3, PO4, PO12	Apply	C,P
CO3	Apply JavaScript, AJAX for scripting HTML documents and networking concepts required for a website.	PO1, PO2, PO3, PO4, PO5, PO12	Apply	C,P
CO4	Implement server-side applications using EJB & Node.js with MongoDB.	PO1, PO2, PO3, PO4, PO5, PO11, PO12	Apply	C,P
CO5	Apply components of Servlets and Java Server Pages (JSP) to handle HTTP requests and session tracking.	PO1, PO2, PO3, PO4, PO5, PO11, PO12	Apply	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Abhishek Goyal		Prof. Anmol Jain	
Prof. Shivani			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**
Course Name: Web Technology **Course Code: BCS502** **Course Coordinator Name: Dr. Abhishek Goyal**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	1	1	1	-	-	-	-	1	-	-	2	1	-
CO2	1	1	1	1	-	-	-	-	1	-	-	2	2	-
CO3	2	2	2	2	2	-	-	-	2	-	-	2	3	-
CO4	2	2	2	3	3	-	-	-	2	-	-	2	3	-
CO5	2	2	2	2	2	-	-	-	2	-	-	2	3	-
PO Target	1.6	1.6	1.6	1.8	2.33	-	-	-	1.6	-	-	2	2.4	-

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Abhishek Goyal		Prof. Anmol Jain	
Prof. Shivani			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
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Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**
Course Name: DAA **Course Code: BCS503** **Course Coordinator Name: Prof. Vivek Kumar Sharma**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Analyze the performance of algorithms using different asymptotic analysis methods	PO1, PO2,PO3, PO12, PSO1	Analyze	C, M
CO2	Understand the concept of Advance Data Structures	PO1, PO2, PO3, PO12, PSO1	Understand	C
CO3	Address computational problems using divide-and-conquer, greedy, and dynamic programming techniques	PO1, PO2, PO3, PO12, PSO1	Apply	C, P
CO4	Illustrate the applications of backtracking, branch-and-bound, string matching, and approximation algorithm.	PO1, PO2, PO3, PO12, PSO1	Apply	C, P
CO5	Understand the concept of P & NP-Problems	PO1, PO2, PO3, PO12, PSO1	Understand	C

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Raj Kumar		Prof. Vivek Kumar Sharma	
Dr. Akash Punhani			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**

Course Name: DAA **Course Code: BCS503** **Course Coordinator Name: Prof. Vivek Kumar Sharma**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	-
CO2	3	2	2	-	-	-	-	-	-	-	-	2	3	-
CO3	3	2	2	-	-	-	-	-	-	-	-	2	3	-
CO4	3	2	2	-	-	-	-	-	-	-	-	2	3	-
CO5	3	2	2	-	-	-	-	-	-	-	-	2	1	-
PO Target	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2.6**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Raj Kumar		Prof. Vivek Kumar Sharma	
Dr. Akash Punhani			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**

Course Name: OOSD with C++ **Course Code: BCS 054** **Course Coordinator Name: Prof. Pravin Srivastav**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the insights of object-oriented programming.	PO2, PO3, PO4, PO12	Understand	C
CO2	Apply the role of overall modeling concepts using UML	PO 2, PO3, PO4, PO5, PO12, PSO1	Apply	C,P
CO3	Understanding various object-oriented analysis and design techniques	PO2, PO3, PO4, PO5, PO12, PSO1	Understand	C,P
CO4	Apply OOPS concepts using C++ programming language	PO1, PO2, PO3, PO4, PO12	Apply	C,P
CO5	Co-relate and Implement object-oriented concepts in example case study based problems using C++	PO1, PO2, PO3, PO4, PO12	Apply	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Pravin Srivastav		Prof. Vinay Pratap Singh	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year:3rd** **Semester: 5th**
Course Name: OOSD with C++ **Course Code: BCS 054** **Course Coordinator Name: Prof. Pravin Srivastav**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	2	3	2	-	-	-	-	-	-	-	2	-	-
CO2	-	3	3	3	2	-	-	-	-	-	-	3	2	-
CO3	-	3	3	2	-	-	-	-	-	-	-	3	2	-
CO4	1	3	3	2	-	-	-	-	-	-	-	3	-	-
CO5	1	3	3	2	-	-	-	-	-	-	-	3	-	-
PO Target	**1**	**2.8**	**3**	**2.2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2.8**	**2**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Pravin Srivastav		Prof. Vinay Pratap Singh	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**

Course Name: Data Analytics **Course Code: BCS052** **Course Coordinator Name: Prof. Shruti Kumari**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Discuss the life cycle phases of Data Analytics through discovery, planning and building.	PO1, PO12, PSO1	Understand	C
CO2	Apply various Data Analysis Techniques.	PO1, PO4, PO5, PO10, PO12, PSO1	Apply	P
CO3	Apply mining techniques on streaming data.	PO1, PO4, PO5, PO10, PO12, PSO1	Apply	P
CO4	Compare different clustering and frequent pattern mining algorithms.	PO1, PO2, PO4, PO5, PO10, PO12, PSO1	Analyze	P
CO5	Apply R tool for developing and evaluating real time applications.	PO1, PO4, PO5, PO10, PO12, PSO1	Apply	P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Shruti Kumari		Prof. Rishabh Chakraborty	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**
Course Name: Data Analytics **Course Code: BCS052** **Course Coordinator Name: Prof. Shruti Kumari**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	-	-	-	-	-	-	-	-	-	-	2	1	-
CO2	2	-	-	2	1	-	-	-	-	1	-	2	2	-
CO3	2	-	-	2	1	-	-	-	-	1	-	2	2	-
CO43	2	2	-	2	1	-	-	-	-	1	-	2	2	-
CO5	2	-	-	2	1	-	-	-	-	2	-	2	2	-
PO Target	2	2	-	2	1	-	-	-	-	1.25	-	2	1.8	-

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Shruti Kumari		Prof. Rishabh Chakraborty	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**

Course Name: Machine Learning Techniques **Course Code: BCS055** **Course Coordinator Name: Prof. Akansha Moral**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Express the need of machine learning for the various problem solving.	PO1, PO2, PO4, PO12, PSO1	Understand	C
CO2	Interpret wide variety of machine learning techniques to learn how these are suitable for solving different real world problems.	PO1, PO2, PO5, PO12, PSO1	Apply	C,P
CO3	Illustrate the latest trends in machine learning.	PO1, PO2, PO4, PO5, PO12, PSO1	Understand	C
CO4	Apply various machine learning algorithms to real-world problems.	PO1, PO2, PO4, PO5, PO12, PSO1	Apply	C,P
CO5	Optimize the models learned and report on the expected accuracy.	PO1, PO2, PO5,PO12, PSO1	Apply	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Baghvan krishna Gupta		Prof. Akansha Moral	
Prof. Umnah			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator | Assoc./ Asst. Head DOC | Signature of Addl. HoD | Signature of HoD

Department of Computer Science

Program Name: B.Tech. **Academic Session:** 2024-25 **Year:** 3rd **Semester:** 5th

Course Name: Machine Learning Techniques **Course Code:** BCS055 **Course Coordinator Name:** Prof. Akansha Moral

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	3	-	2	-	-	-	-	-	-	-	2	2	-
CO2	3	3	-	-	2	-	-	-	-	-	-	2	2	-
CO3	2	3	-	2	2	-	-	-	-	-	-	2	2	-
CO4	3	2	-	2	2	-	-	-	-	-	-	2	2	-
CO5	3	2	-	-	2	-	-	-	-	-	-	2	2	-
PO Target	**2.6**	**2.6**	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Baghvan krishna Gupta		Prof. Akansha Moral	
Prof. Umnah			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**
Course Name: COI **Course Code: BNC-501** **Course Coordinator Name: Prof. Vikas Gangwar**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Explore the basic features and modalities about the Indian constitution.	PO6, PO7	Understand	F,C
CO2	Differentiate the functioning of Indian parliamentary system at the center and state level	PO6, PO7	Analyze	F,P
CO3	Differentiate different aspects of the Indian Legal System and its related bodies.	PO6, PO7, PO8	Analyze	F,P
CO4	Discover different laws and regulations related to engineering practices.	PO6, PO7, PO8, PO10	Understand	F,C
CO5	Correlate role of engineers with different organizations and governance models	PO6, PO7, PO8, PO9, PO10, PO11, PO12	Understand	F,C

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
1. Prof. Vikas Gangwar			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**
Course Name:COI **Course Code: KNC-501** **Course Coordinator Name: Prof. Pallavi Sharma**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	3	2	-	-	-	-	-	-	-
CO2	-	-	-	-	-	3	2	-	-	-	-	-	-	-
CO3	-	-	-	-	-	3	2	1	-	-	-	-	-	-
CO4	-	-	-	-	-	3	2	2	-	2	-	-	-	-
CO5	-	-	-	-	-	2	2	2	2	2	2	2	-	-
PO Target	**-**	**-**	**-**	**-**	**-**	**2.80**	**2**	**1.67**	**2**	**2**	**2**	**2**	**-**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
1. Prof. Vikas Gangwar			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**

Course Name: DBMS Lab **Course Code: BCS551** **Course Coordinator Name: Prof. Arushi Gupta**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Implement the concepts of table creation, views, indexes and other database objects using Oracle 10g express edition.	PO1, PO2, PO4, PO5, PO11, PO12	**Apply**	**P**
CO2	Solve simple and complex queries using DDL, DML, DCL and TCL.	PO1, PO2, PO4, PO11, PO12	**Apply**	**P**
CO3	Utilize entity integrity, referential integrity, key constraints and domain constraints on database.	PO1, PO2, PO4, PO11, PO12	**Apply**	**P**
CO4	Implement the PL/SQL blocks, procedure functions, packages and triggers, cursors.	PO1, PO2, PO4, PO11, PO12	**Apply**	**P**
CO5	Design a database schema for a real-world problem like Hospital management system.	PO1, PO2, PO3, PO4, PO11, PO12, PSO1, PSO2	**Apply**	**P**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Ajay K Srivastava		Ms. Arushi Gupta	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Dr, Gaurav Dubey			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**
Course Name: DBMS Lab **Course Code: BCS551** **Course Coordinator Name: Prof. Arushi Gupta**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	-	1	3	-	-	-	-	-	2	2	-	-
CO2	3	3	-	3	-	-	-	-	-	-	2	2	-	-
CO3	3	3	-	3	-	-	-	-	-	-	2	2	-	-
CO4	3	3	-	3	-	-	-	-	-	-	2	2	-	-
CO5	3	3	2	3	-	-	-	-	-	-	3	3	2	3
PO Target	**3**	**3**	**2**	**2.60**	**3**	**-**	**-**	**-**	**-**	**-**	**2.20**	**2.20**	**2**	**3**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Ajay K Srivastava		Ms. Arushi Gupta	
Dr, Gaurav Dubey			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**
Course Name: Web Technology Lab **Course Code: BCS552** **Course Coordinator Name: Dr. Abhishek Goyal**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Implement HTML, CSS, JavaScript and XML to develop dynamic and responsive website.	PO1, PO2, PO3, PO4, PO5, PO9, PO12, PSO1	Apply	C,P
CO2	Implement different components of Java Bean and Node.js to develop web application withMongoDB	PO1, PO2, PO3, PO4, PO5, PO9, PO12, PSO1	Apply	C,P
CO3	Construct server-side java application using Servlet & JSP tools to process request and response data.	PO1, PO2, PO3, PO4, PO5, PO9, PO12, PSO1	Apply	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Abhishek Goyal		Prof. Anmol Jain	
Prof. Shivani			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 number of COs.
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Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**
Course Name: Web Technology Lab **Course Code: BCS552** **Course Coordinator Name: Dr. Abhishek Goyal**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	2	2	1	1	-	-	-	2	-	-	2	2	-
CO2	2	2	2	3	3	-	-	-	2	-	-	2	2	-
CO3	2	2	2	2	2	-	-	-	2	-	-	2	2	-
PO Target	1.67	2	2	2	2	-	-	-	2	-	-	2	2	-

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Abhishek Goyal		Prof. Anmol Jain	
Prof. Shivani			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
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Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year:3rd** **Semester: 5th**
Course Name: DAA Lab **Course Code: BCS553** **Course Coordinator Name: Dr. Akash Punhani**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Implement algorithm to solve problems by iterative approach.	PO1,PO2, PO3,PO4, PO5, PO12, PSO1	Apply	P
CO2	Implement algorithm to solve problems by divide and conquer approach	PO1, PO2, PO3, PO4, PO5, PO12, PSO1	Apply	P
CO3	Implement algorithm to solve problems by Greedy algorithm approach.	PO1, PO2, PO3, PO4, PO5, PO12, PSO1	Apply	P
CO4	Implement algorithm to solve problems by Dynamic programming, backtracking, branch and bound approach	PO1, PO2, PO3, PO4, PO5, PO12, PSO1	Apply	P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Dr. Raj Kumar		Prof. Vivek Sharma	
Dr. Akash Punhani			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year:3rd** **Semester: 5th**
Course Name: DAA Lab **Course Code: BCS553** **Course Coordinator Name: Dr. Akash Punhani**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	1	2	2	-	-	-	-	-	-	2	3	-
CO2	3	2	1	2	2	-	-	-	-	-	-	2	3	-
CO3	3	2	1	2	2	-	-	-	-	-	-	2	3	-
CO4	3	2	1	2	3	-	-	-	-	-	-	2	3	-
PO Target	3	2	1	2	2.25	-	-	-	-	-	-	2	3	-

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Dr. Raj Kumar		Prof. Vivek Sharma	
Dr. Akash Punhani			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 3rd** **Semester: 5th**
Course Name: Mini Project **Course Code: BCS554** **Course Coordinator Name: Prof. Vinay Pratap Singh**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Identify a problem and gather its requirements	PO1, PO2, PO3, PO4, PO5, PO6, PO9, PO10, PO11, PO12,PSO1, PSO2	Analyze	C
CO2	Design a solution of the problem using latest tools & techniques.	PO1, PO2, PO3, PO4, PO5, PO9, PO11, PO12,PSO1, PSO2	Understand	C
CO3	Develop a project using latest technology.	PO1, PO2, PO3, PO4, PO5, PO6, PO9, PO11, PO12, PSO1, PSO2	Apply	C
CO4	Develop professional skills and critical thinking to prepare for major project	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12,PSO1, PSO2	Apply	C
CO5	Demonstrate an ability to present project works to the evaluators.	PO1, PO8, PO9, PO10, PO11, PO12, PSO1, PSO2	Understand	C

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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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.

Prof. Vinay Pratap Singh		Prof. Arti Sharma	
Prof. Neha Shukla			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year:3rd** **Semester: 5th**
Course Name: Mini Project **Course Code: BCS554** **Course Coordinator Name: Prof. Vinay Pratap Singh**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	3	3	2	-	-	2	2	2	3	2	2
CO2	3	3	3	3	3	-	-	-	2	-	2	3	2	3
CO3	3	3	3	3	3	1	-	-	3	-	2	2	3	2
CO4	3	3	3	3	3	2	-	2	3	2	2	3	2	2
CO5	2	-	-	-	-	-	-	2	2	3	2	3	2	2
PO Target	**2.8**	**3**	**3**	**3**	**3**	**1.67**	**-**	**2**	**2.4**	**2.33**	**2**	**2.80**	**2.2**	**2.2**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Vinay Pratap Singh		Prof. Arti Sharma	
Prof. Neha Shukla			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**

Course Name: Software Testing **Course Code: KCS076** **Course Coordinator Name: Prof. Shreela Pareek**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the basics of software testing, its objectives, validation and verification approach	PO1, PO2, PO4, PO8, PO10, PO11, PSO1	Understand	C
CO2	Illustrate various functional and structural testing methods of software products.	PO1, PO2, PO4, PSO1	Apply	C, P
CO3	Determine the process of Test Selection for Regression Testing and minimization of test cases	PO1, PO2, PO4, PSO1	Understand	C, P
CO4	Explore testing activities and test data generation tools.	PO1, PO2, PO4, PO5, PO12, PSO1	Analyze	C, P
CO5	Apply object oriented and web application test cases on Testing tools.	PO1, PO2, PO4, PO5, PO12, PSO1	Apply	C, P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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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.

Ms. Shreela Pareek		Mr. Rishabh Chakraborty	
Dr. Kalpna Sagar			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: Software Testing **Course Code: KCS076** **Course Coordinator Name: Prof. Shreela Pareek**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	2	-	2	-	-	-	2	-	2	1	-	1	-
CO2	1	2	-	2	-	-	-	-	-	-	-	-	1	-
CO3	1	2	-	2	-	-	-	-	-	-	-	-	1	-
CO4	1	2	-	2	2	-	-	-	-	-	-	2	2	-
CO5	1	2	-	2	2	-	-	-	-	-	-	2	2	-
PO Target	**1**	**2**	**-**	**2**	**2**	**-**	**-**	**2**	**-**	**2**	**1**	**2**	**1.4**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Ms. Shreela Pareek		Mr. Rishabh Chakraborty	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Dr. Kalpna Sagar			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: Cloud Computing **Course Code: KCS713** **Course Coordinator Name: Prof. Vinay Pratap Singh**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the evolution & principles of cloud computing.	PO1, PO2, PO5,PO9, PO12, PSO2	Understand	F,C
CO2	Apply Virtualization of hardware and software resources for Cloud Computing.	PO1, PO2, PO5,PO8,PO9, PO10,PO12, PSO1,PSO2	Apply	C,P
CO3	Implement data access management, data storage and computing services on Cloud.	PO1, PO2, PO5,PO8,PO9, PO10,PO12, PSO1,PSO2	Apply	C,P
CO4	Explain Inter cloud resources management, cloud storage services and Security Services.	PO1, PO2, PO5,PO8,PO9, PO10,PO12, PSO2	Understand	F,C
CO5	Analyze standards, and applications of advanced cloud technologies.	PO1, PO2, PO3,PO4,PO5,PO8,PO9, PO10, PO11, PO12, PSO1,PSO2	Analyze	F,C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The theory courses/ project having credits 3 to 6 should have 5 number of COs. The laboratory course/ mini project/ seminar/ industrial training having credits less than 3 should have 3 number of COs. The Project having 7 to 12 credits should have 6 to 10 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.

Prof. Vinay Pratap Singh		Prof. Amit Kumar Singh Sanger	
Prof. Anmol Jain			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: Cloud Computing **Course Code: KCS713** **Course Coordinator Name: Prof. Vinay Pratap Singh**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	1	-	-	2	-	-	-	1	-	-	2	-	2
CO2	2	1	-	-	2	-	-	1	1	1	-	2	1	2
CO3	2	1	-	-	2	-	-	1	1	1	-	2	1	2
CO4	3	2	-	-	2	-	-	1	1	1	-	2	-	2
CO5	3	3	2	2	3	-	-	2	2	1	2	2	2	2
PO Target	2.4	1.6	2	2	2.2	-	-	1.25	1.2	1	2	2	1.33	2

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Vinay Pratap Singh		Prof. Amit Kumar Singh Sanger	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Prof. Anmol Jain			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**

Course Name: PME **Course Code: KHU702** **Course Coordinator Name: Prof. Shivani**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Understand the theories of entrepreneurship and Entrepreneurial Development Programmes.	PO6, PO9, PO11, PSO1	Understand	F
CO2	Create innovative business ideas and market opportunities for business development.	PO6, PO9, PO11, PSO1	Understand	C
CO3	Understand the importance of Project life cycle and different types of appraisal techniques.	PO6, PO7, PO9, PO10, PO11, PO12, PSO1	Understand	C
CO4	Define different types of project financing requirements on the basis of cash flow statements.	PO6, PO9, PO10, PO11, PO12	Apply	P
CO5	Describe social entrepreneurship opportunities and risk management techniques in social enterprises.	PO6, PO7, PO9, PO11, PO12	Understand	C

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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.

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Neha Shukla		Prof. Pravin Kumar	
Prof. Shivani			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: PME **Course Code: KHU702** **Course Coordinator Name: Prof. Shivani**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	1	-	-	2	-	2	-	1	-
CO2	-	-	-	-	-	1	-	-	1	-	1	-	2	-
CO3	-	-	-	-	-	2	1	-	2	1	1	1	2	-
CO4	-	-	-	-	-	1	-	-	2	2	2	1	-	-
CO5	-	-	-	-	-	2	2	-	2	-	1	1	-	-
PO Target	-	-	-	-	-	1.4	1.5	-	2.8	1.5	1.4	1	1.6	-

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Prof. Neha Shukla		Prof. Pravin Kumar	
Prof. Shivani			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: RER **Course Code: KOE074** **Course Coordinator Name: Prof. Rajendra Kumar Patel**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Classify the renewable and non- renewable sources of energy.	PO1, PO2, PO7	Understand	F
CO2	Illustrate the working principle of various solar energy system.	PO1, PO2, PO7	Understand	F,C
CO3	Discuss the Geothermal & Tidal energy, its mechanism of production and its applications.	PO1, PO2, PO12	Understand	F,C
CO4	Interpret winds energy as alternative form of energy and its tapping.	PO1, PO2, PO7, PO12	Remember	F,C
CO5	Summarize the basics of biomass energy sources and relevant thermos-dynamics	PO1, PO2, PO7	Understand	F,C

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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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.

Prof. Rajendra Kumar Patel		Prof. Shruti Kumari	
Prof. Vikas Gangwar			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**

Course Name: RER **Course Code: KOE074** **Course Coordinator Name: Prof. Rajendra Kumar Patel**

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1		-	2	-	-	3	-	-	-	-	1	-	-
CO2	1	-	-	2	-	2	3	-	-	-	-	1	-	-
CO3	1	-	-	2	-	-	3	-	-	-	-	1	-	-
CO4	1	-	-	2	-	-	3	-	-	-	-	1	-	-
CO5	1	-	-	2	-	-	3	-	-	-	-	1	-	-
PO Target	**1**	**-**	**-**	**2**	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**1**	**-**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Rajendra Kumar Patel		Prof. Shruti Kumari	
Prof. Vikas Gangwar			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

- The strength of correlation between COs and POs/ PSOs/APOs should be represented as 1 (low correlation), 2 (medium correlation) and 3 (high correlation) in CO - PO/APO/PSO Matrix.
- If there is no correlation, then put a "-" (dash).

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: ST Lab **Course Code: KCS751A** **Course Coordinator Name: Prof. Rishabh Chakraborty**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
1	Derive effective test cases based on software requirements.	PO1, PO2, PO4, PO8, PO9, PO12	Apply	P
2	Apply a wide variety of testing techniques in an effective way.	PO1, PO2, PO4, PO5, PO8, PO12, PSO1	Apply	P
3	Simulate various test scenarios using automated software testing tool (Selenium).	PO1, PO2, PO4, PO5, PO8, PO12, PSO1	Apply	P
4	Analyze test plan for the project and report generation using Mantis BT.	PO1, PO2, PO4, PO5, PO8, PO9, PO12, PSO1	Analyze	P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Rishabh Chakraborty		Prof. Shreela Parekh	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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Dr. Abhishek Goyal			

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: ST Lab **Course Code: KCS751A** **Course Coordinator Name: Prof. Rishabh Chakraborty**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2	-	1	-	-	-	1	1	-	-	2	2	-
CO2	2	2	-	1	-	-	-	1	1	-	-	2	-	-
CO3	2	2	-	1	3	-	-	1	1	-	-	2	2	-
CO4	2	2	-	1	3	-	-	1	2	-	-	2	2	-
PO Target	**2**	**2**	**-**	**1**	**3**	**-**	**-**	**1**	**1.25**	**-**	**-**	**2**	**2**	**-**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Rishabh Chakraborty		Prof. Shreela Parekh	
Dr. Abhishek Goyal			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**

Course Name: Internship Assessment **Course Code: KCS752** **Course Coordinator Name: Prof. Vivek Kumar Sharma**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Identify a problem and gather its requirements.	PO1, PO2, PO3,PO6,PO10, PSO1, PSO2	Apply	C
CO2	Design a solution of the problem using latest tools & techniques.	PO1, PO2, PO3, PO6, PSO1, PSO2	Apply	P
CO3	Develop a project using latest technology.	PO1, PO2, PO3, PSO1, PSO2	Create	C
CO4	Develop professional skills and critical thinking to prepare for major project.	PO1, PO2, PO3, PO6, PO10, PSO1, PSO2	Analyze	P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Vivek Kumar Sharma		Prof. Arushi	
Prof. Rohan Rathore			

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year:4th** **Semester:7th**
Course Name: Internship Assessment **Course Code: KCS752** **Course Coordinator Name: Prof. Harsh Vardhan**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	-	-	2	-	-	-	2	-	-	2	2
CO2	3	3	3	-	-	1	-	-	-	-	-	-	2	3
CO3	3	3	3	-	-	-	-	-	-	-	-	-	3	2
CO4	3	3	3	-	-	2	-	-	-	2	-	-	2	2
PO Target	**3**	**3**	**3**	-	-	**1.67**	-	-	-	**2**	-	-	**2.25**	**2.25**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Vivek Kumar Sharma		Prof. Arushi	
Prof. Rohan Rathore			

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Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech **Academic Session: 2024-25** **Year:4th** **Semester: 7th**

Course Name: Project Lab **Course Code: KCS753** **Course Coordinator Name: Prof. Sreesh Gaur**

Course Outcomes

After completion of the course, the student will be able to		**Relevant POs/ PSOs**	**Revised Bloom's Level (BL)**	**Knowledge Category (KC)**
CO No.	**Statement of Course Outcome**			
CO1	Select and summarize all aspects of real-life problem through information gathering.	PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12, PSO1, PSO2	Understand	C,P
CO2	Apply acquired knowledge to develop a Conceptual model.	PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12, PSO1, PSO2	Apply	C,P
CO3	Analyze the outcome of each phase using various tools and techniques.	PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12, PSO1, PSO2	Analyze	C,P
CO4	Defend the validity of idea or quality of result with the previous data/ result.	PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12, PSO1, PSO2	Evaluate	C,P
CO5	Test the working model and demonstrate the results by publishing the idea/outcome.	PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12, PSO1, PSO2	Create	C,P

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature

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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.

Prof. Sreesh Gaur		Dr. Akash Punhani	
Dr. Gaurav Dubey		Dr. Akash Goel	
Prof. Vandana		Prof. Shreela Parekh	

Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

Department of Computer Science

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: Project Lab **Course Code: KCS753** **Course Coordinator Name: Prof. Sreesh Gaur**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	3	3	3	3	1	2	-	3	2	3	3	3	3
CO2	-	3	3	3	2	1	2	-	3	2	3	3	3	3
CO3	-	3	3	3	2	1	2	-	3	2	3	3	3	3
CO4	-	3	3	3	2	1	2	-	3	2	2	2	3	3
CO5	-	3	3	3	2	1	2	-	3	2	1	2	3	3
PO Target	**-**	**3**	**3**	**3**	**2.2**	**1**	**2**	**-**	**3**	**2**	**2.4**	**2.6**	**3**	**3**

Faculty Members Teaching the Course	Signature	Faculty Members Teaching the Course	Signature
Prof. Sreesh Gaur		Dr. Akash Punhani	
Dr. Gaurav Dubey		Dr. Akash Goel	
Prof. Vandana		Prof. Shreela Parekh	

Please Note (Reference: OBE Guidelines wef. Session 2021 – 22)

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Signature of Course Coordinator **Assoc./ Asst. Head DOC** **Signature of Addl. HoD** **Signature of HoD**

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