SEMESTER –III

SN	Subject Code	Subject	Type	Category	Periods			Sessional Component		Sessional (SW) (TS/PS)	End Semester Examination (ESE)	Total SW+ESE	Credit Cr
					L	T	P	CT	TA	CT+TA	TE/PE		
1	BOE3** / BAS303	Science Based Open Elective/BSC (Maths-III/Math IV/ Math V)	T	ES/BS	3	1	0	20	10	30	70	100	4
2	BVE301 / BAS301	Universal Human Value and Professional Ethics/ Technical Communication	T	VA/HS	2	1	0	20	10	30	70	100	3
3	BCS301	Data Structure	T	PC	3	1	0	20	10	30	70	100	4
4	BCS302	Computer Organization and Architecture	T	PC	3	1	0	20	10	30	70	100	4
5	BCS303	Discrete Structures & Theory of Logic	T	PC	2	1	0	20	10	30	70	100	3
6	BCS351	Data Structure Lab	P	PC	0	0	2		50	50	50	100	1
7	BCS352	Computer Organization and Architecture Lab	P	PC	0	0	2		50	50	50	100	1
8	BCS353	Web Designing Workshop	P	PC	0	0	2		50	50	50	100	1
10	BCC301 / BCC302	Cyber Security/Python programming	T	VA	2	0	0	20	10	30	70	100	2
11	BCC351	Internship Assessment /Mini Project*	P							100		100	2
		Total			**15**	**5**	**6**						**25**

- **Mathematics –III** for CE / ENV and allied branches
- **Mathematics-IV** for Computer/Electronics/Electrical & allied Branches, Mechanical & Allied Branches Textile/Chemical & allied Branches
- **Mathematics-V** for Bio Technology / Agriculture Engineering

Department of CSE (AI&ML)

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

Course Name:Math IV **Course Code: BAS 303** **Course Coordinator Name: Dr. Neelam Sharma**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Solve partial differential equations by Lagrange, Charpit and other particular methods..	PO1,PO2,PO12/PSO1,PSO2	Apply	Conceptual and Procedural
CO2	Apply the method of separation of variables to solve Wave , Heat and Laplace equation. Application of Fourier transform.	PO1,PO2,PO3,PO12/PSO1,PSO2	Apply	Conceptual and Procedural
CO3	Determine moments, correlation, linear regression lines and obtain best fitting curves to the given data.	PO1,PO2,PO3,PO4,PO5,PO12/PSO1PSO,2	Apply	Conceptual and Procedural
CO4	Apply the concept of probability to solve discrete and continuous probability problems.	PO1,PO2,PO3,PO4,PO5,PO12/PSO1PSO,2	Apply	Conceptual and Procedural
CO5	Apply the theory of sampling to solve t-test, z-test and Chisquare test problems.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO12/PSO1,PSO2	Apply	Conceptual and Procedural

Faculty Members Teaching the Course	Signature
1. Dr. Neelam Sharma	Neelam

Neelam

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

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 CSE (AI&ML)

Program Name: B.Tech.
Course Name: Maths 1V

Academic Session: 2024-25
Course Code: BAS 303

Year: 2024 **Semester: III**
Course Coordinator Name: Dr. Neelam 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	2	-	-	-	-	-					2	0	0
CO2	2	2	2	-	-	-	-					2	1	0
CO3	2	2	2	2	2	-	-					2	0	1
CO4	2	2	1	1	1	-	-					1	0	1
CO5	2	1	2	2	2	2	2					2	0	1
PO Target	2	1.8	1.75	1.6	1.6	2	2					1.8	1	1

Faculty Members Teaching the Course	Signature
1. Dr. Neelam Sharma	Neelam

Signature of Course Coordinator

Assoc./ Asst. Head DOC

Signature of Addl. HoD

Signature of Dean

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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Department of CSE (AI&ML)

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

Course Name: Data Structures **Course Code: BCS-301** **Course Coordinator Name: Dr. Shelly Gupta**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	Conceptual, Procedural
CO2	Implement the working of abstract data types like Stack and Queue to solve scenario-based problems.	PO1, PO2, PO3, PO4, PO12, PSO1	Apply	Conceptual, Procedural
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	Conceptual, Procedural
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	Conceptual, Procedural
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	Conceptual, Procedural

Faculty Members Teaching the Course	Signature
1. Ms. Bhawna	21-10-24
2. Mr. Gangadhar Thammali	22/10/2024
3. Mr. Rachit Patel	21/10/2024

21/10/24

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

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 CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2024** **Semester: III**
Course Name: Data Structures **Course Code: BCS-301** **Course Coordinator Name: Dr. Shelly 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	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
1. Ms. Bhawna 2. Mr. Gangadhar Thammali 3. Mr. Rachit Patel	21/10/24 Gangadhar 22/10/2024 21/10/2024

Signature of Course Coordinator 22/10/24 Assoc./ Asst. Head DOC Signature of Addl. HoD Signature of Dean

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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Department of CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year:2024** **Semester: III**
Course Name: COA **Course Code: BCS302** **Course Coordinator Name: Ms. Umang Kant**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	3	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	4	C, P
CO3	**Analyze** the performance issues of the processor and classify the control unit implementation techniques.	PO1, PO2, PO3, PO4, PO12, PSO1, PSO2	4	C, P
CO4	**Categorize** the hierarchical memory system and examine the virtual memory implementation techniques.	PO1, PO2, PO3, PO4, PO12, PSO1, PSO2	4	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	4	C, P

Faculty Members Teaching the Course	Signature
1. Ms. Umang Kant 2. Ms. Payal Chhabra 3. Ms. Chayanika Bhattacharjee 4. Ms. Ayushi Mittal	

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

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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Department of CSE (AI&ML)

Program Name: B.Tech
Course Name: COA
CO - PO/PSO/APO Matrix

Academic Session: 2024-25
Course Code: BCS-302

Year: 2024 **Semester: III**
Course Coordinator Name: Ms. Umang Kant

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
1. Ms. Umang Kant 2. Ms. Payal Chhabra 3. Ms. Chayanika Bhattacharjee 4. Ms. Ayushi Mittal	

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

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 CSE (AI&ML)

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

Course Name: DSTL **Course Code: BCS303** **Course Coordinator Name: Ms. Kavya Gupta**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	**Apply**	Conceptual, Procedural
CO2	**Apply** fundamental concepts of functions and Boolean algebra for solving the problems of logical abilities.	PO1, PO2, PO3, PO5, PO12, PSO1	**Apply**	Conceptual, Procedural
CO3	**Employ** the rules of propositions and predicate logic to solve the complex and logical problems.	PO1, PO2, PO3, PO4, PO5, PO12, PSO1	**Apply**	Factual, Conceptual, Procedural
CO4	**Explore** the concepts of group theory and their applications for solving the advance technological problems.	PO1, PO2, PO3, PO5, PO12, PSO1	**Analyze**	Conceptual, Procedural
CO5	**Illustrate** the principles and concepts of graph theory for solving problems related to computer science.	PO1, PO2, PO3, PO5, PO12, PSO1	**Analyze**	Factual, Conceptual, Procedural

Faculty Members Teaching the Course	Signature
1. Ms. Kavya Gupta 2. Ms. Shaifali Rao	22/10/24

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

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

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Department of CSE (AI&ML)

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

Course Name: Discrete Structures & Theory of Logic **Course Code: BCS303** **Course Coordinator Name: Ms. Kavya 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	1	1	1	1	-	-	-	-	-	-	1	2	-
CO2	3	1	1	-	2	-	-	-	-	-	-	1	2	-
CO3	3	1	1	2	2	-	-	-	-	-	-	1	2	-
CO4	3	2	1		1	-	-	-	-	-	-	1	2	-
CO5	3	3	2		2	-	-	-	-	-	-	2	2	-
PO Target	3	1.6	1.2	1.5	1.6	-	-	-	-	-	-	1.2	2	-

Faculty Members Teaching the Course	Signature
1. Ms. Kavya Gupta 2. Ms. Shaifali Rao	

22/10/24

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

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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Department of CSE (AI&ML)

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

Course Name: Data Structures Lab **Course Code:BCS 351** **Course Coordinator Name:Dr. Shelly Gupta**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO 1	Perform the primitive operation on various types of data structures	PO1, PO2, PO3, PO12, PSO1	3	C, P
CO 2	Apply the concepts of data structure in problem solving.	PO1, PO2, PO3, PO12, PSO1	3	C, P
CO 3	Make a solution for the scenario-based problems in terms of algorithm and programming code on competitive platforms.	PO1, PO2, PO3, PO12, PSO1	4	C, P

Faculty Members Teaching the Course	Signature
1. Ms. Bhawna 2. Mr. Gangadhar Thammali 3. Mr. Rachit Patel	21/10/24 Gangadhar 21/10/24 21/10/2024

Signature of Course Coordinator 22/10/24 Assoc./ Asst. Head DOC Signature of Addl. HoD Signature of Dean

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

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Department of CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year:2024** **Semester: III**
Course Name: Data Structures Lab **Course Code: BCS-351** **Course Coordinator Name: Dr. Shelly 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	2									2	3	
CO2	3	3	3									2	3	
CO3	3	3	3									2	3	
CO4														
CO5														
PO Target	2.67	2.34	2.67									2	3	

Faculty Members Teaching the Course	Signature
1. Ms. Bhawna 2. Mr. Gangadhar Thammali 3. Mr. Rachit Patel	21/10/24 21/10/24 21/10/2024

22/10/24

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

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Department of CSE (AI&ML)

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

Course Name: COA Lab **Course Code: BCS-352** **Course Coordinator Name: Ms. Umang Kant**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	3	C, P
CO2	Simulate the combinational circuits for binary arithmetic (such as adders, subtractors, and multiplier) and code converter.	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PO12	3	C, P
CO3	Simulate combinational circuits for encoders/decoders and selection devices multiplexers/demultiplexers using logic gates.	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PO12, PSO1, PSO2	3	C, P
CO4	Simulate 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	3	C, P
CO5	Simulate the 2-bit Arithmetic Logic Unit using logic gates.	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PO12, PSO1, PSO2	3	C, P

Faculty Members Teaching the Course	Signature
1. Ms. Umang Kant 2. Ms. Payal Chhabra 3. Ms. Chayanika Bhattacharjee 4. Ms. Ayushi Mittal	

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

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

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Program Name: B.Tech **Academic Session: 2024-25** **Year:2024** **Semester: III**
Course Name: COA Lab **Course Code: BCS352** **Course Coordinator Name: Ms. Umang Kant**

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				
CO2	3	3	3	2	1				1	1		1		
CO3	2	3	3	2	1				1	1		1	1	1
CO4	2	3	3	2	1				1	1		1	2	1
CO5	2	3	3	2	1				1	1		1	1	1
PO Target	2.2	2.8	2.8	1.8	1				1	1		1	1.67	1

Faculty Members Teaching the Course	Signature
1. Ms. Umang Kant 2. Ms. Payal Chhabra 3. Ms. Chayanika Bhattacharjee 4. Ms. Ayushi Mittal	

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

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

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Department of CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: 3r**

Course Name: Mini Project **Course Code: BCC-351** **Course Coordinator Name: Ms. Priyanka**

Course Outcomes:

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Discover potential research areas in the field of IT	PO1,PO2,PO3,PO4,PO5, PO6,PO9,PO10,PO11,PO12,PSO1,PSO2	2	F
CO2	Compare and contrast the several existing solutions for research challenge.	PO1,PO2,PO3,PO4,PO5,PO9,PO10,PO11, PO12,PSO1, PSO2	5	C
CO3	Demonstrate an ability to work in teams and manage the conduct of the research study	PO1,PO2,PO3,PO4,PO5,PO6PO9,PO10,PO 11,PO12,PSO1, PSO2	4	P
CO4	Formulate and propose a plan for creating a solution for the research plan identified.	PO1,PO2,PO3,PO4,PO5,PO6,PO9,PO10,P O11,PO12,PSO1, PSO2	5	P
CO5	To report and present the findings of the study conducted in the preferred domain.	PO1,PO9,PO11	5	P

Faculty Members Teaching the Course	Signature
1. Ms. Priyanka	

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

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

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Department of CSE (AI&ML)

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

Course Name: Mini Project **Course Code: BVE 301** **Course Coordinator Name: Ms. Priyanka**

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	-	-	3	-	2	3	2	2
CO5	2	-	-	-	-	-	-	-	2	-	2	-	-	-
PO Target	2.8	3.0	3.0	3.0	3.0	1.67	0	2.0	2.4	2.33	2.0	2.8	2.2	2.2

Faculty Members Teaching the Course	Signature
1. Ms. Priyanka	

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

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 CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: III**
Course Name: Python Programming **Course Code: BCC302** **Course Coordinator Name: Mr. Abhishek Kumar**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	2	C
CO2	Acquire proficiency in handling strings and functions and be fluent in using Python control flow statements.	PO1, PO2, PO3, PO12, PSO1, PSO2	3	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, PO5, PO12, PSO1, PSO2	3	C, P
CO4	Apply the commonly used operations involved in file handling.	PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2	3	C, P
CO5	Explain and use different in-built functions of packages and connect with GUI programming.	PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2	3	C, P

Faculty Members Teaching the Course	Signature
1. Mr. Abhishek Kumar 2. Ms. Nishtha Negi	

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

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

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

Department of CSE (AI&ML)

Program Name: B.Tech **BAcademic Session: 2024-25** **Year:2024** **Semester: III**
Course Name: Python Programming **Course Code: BCC302** **Course Coordinator Name: Mr. Abhishek 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	1											1	
CO2	2	2	1									2	2	1
CO3	3	3	1	1	1							2	2	1
CO4	3	2	2	1	1							2	2	1
CO5	3	3	2	1	1							2	2	1
PO Target	2.6	2.2	1.5	1	1							2	1.8	1

Faculty Members Teaching the Course	Signature
1. Mr. Abhishek Kumar 2. Ms. Nishtha Negi	Nishtha

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

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.

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Department of CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: II** **Semester: V**
Course Name: Universal Human Value and Professional Ethics **Course Code: BVE301** **Course Coordinator Name: Ms. Akanksha**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	Conceptual, Procedural
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	Conceptual, Procedural
CO3	Interpret the process of developing harmony in family, society and in universal order.	PO6, PO7, PO8,PO9, PO12	Understand	Conceptual, Procedural
CO4	Express the process of developing harmony in nature as self-organizing unit and in its coexistence.	PO6, PO7, PO8,PO9, PO12	Understand	Conceptual, Procedural
CO5	Analyze ethical, unethical practices and strategy in larger order based on case studies.	PO6, PO7, PO8,PO9, PO12	Analyze	Conceptual, Procedural

Faculty Members Teaching the Course	Signature
1. Ms. Akanksha	
2. Ms. Priyanka	

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

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 CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: II** **Semester: V**
Course Name: Universal Human Value and Professional Ethics **Course Code: BVE301** **Course Coordinator Name: Ms. Akanksha**

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
1. Ms. Akanksha	
2. Ms. Priyanka	

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

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).

B.TECH.

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING CURRICULUM STRUCTURE

SEMESTER- V

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KCS501	Database Management System	3	1	0	30	20	50		100		150	4
2	KAI501	Artificial Intelligence	3	1	0	30	20	50		100		150	4
3	KCS503	Design and Analysis of Algorithm	3	1	0	30	20	50		100		150	4
4	Dept. Elective-I	Departmental Elective-I	3	0	0	30	20	50		100		150	3
5	Dept. Elective-II	Departmental Elective-II	3	0	0	30	20	50		100		150	3
6	KCS551	Database Management System Lab	0	0	2				25		25	50	1
7	KAI551	Artificial Intelligence Lab	0	0	2				25		25	50	1
8	KCS553	Design and Analysis of Algorithm Lab	0	0	2				25		25	50	1
9	KCS554	Mini Project or Internship Assessment*	0	0	2				50			50	1
10	KNC501/ KNC502	Constitution of India. Law and Engineering / Indian Tradition, Culture and Society	2	0	0	15	10	25		50			
11		MOOCs (Essential for Hons. Degree)											
		Total										**950**	**22**

*The Mini Project or internship (4 weeks) conducted during summer break after IV semester and will be assessed during V semester.

Department of CSE (AI&ML)

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

Course Name: Database management system **Course Code: BCS-501** **Course Coordinator Name: Dr. Pratibha Singh**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	PO1,PO2,PO3,PO4,PO5,PO9,PO10, PO11,PO12,PSO1	3,6	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,PO12,PSO1	3	C,P
CO3	Solve the redundancy problem in database tables using normalization.	PO1,PO2,PO3,PO4,PO5,PO6, PO9,PO10, PO12,PSO1	3	C,P
CO4	Understand the concepts of transactions and recovery schemes.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8, PO12,PSO1	3	C,P
CO5	Understand the concepts of concurrency control techniques.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8, PO12,PSO1	3	F,P

Faculty Members Teaching the Course	Signature
1. Dr. Pratibha Singh	
2. Ms. Nidhi Singh	
3. Mr. Nagendra Nath Dubey	

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

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 CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester:5th**
Course Name: Database management system **Course Code: BCS-501** **Course Coordinator Name: Dr. Pratibha 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	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	1.6	1	1	2	2.5	2	3	3	-

Faculty Members Teaching the Course	Signature
1. Dr. Pratibha Singh	
2. Ms. Nidhi Singh	
3. Mr. Nagendra Nath Dubey	

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

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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Department of CSE (AIML)

Program Name: CSE-AIML **Academic Session: 2024-25** **Year: 2024** **Semester: V**
Course Name: B.TECH **Course Code: BCAI-501** **Course Coordinator Name: Dr. Gaurav Srivastav**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Understand the fundamental concepts, theories, and techniques in artificial intelligence (AI), and apply diverse approaches for effective problem-solving	PO1, PO2, PSO1, PSO2	Understand	Conceptual
CO2	Analyze search techniques and gaming theory.	PO1, PO2, PO4, PSO1, PSO2	Analyze	Conceptual, Procedural
CO3	Apply knowledge representation techniques and problem-solving strategies to common AI applications.	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2	Apply	Conceptual, Procedural
CO4	Examine the use case of AI in real world societal problems and Software agents.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO12, PSO1, PSO2	Analyze	Conceptual, Procedural
CO5	Analyze the applicability of Artificial Intelligence Approaches to develop sustainable solutions using professional ethics.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO11, PO12, PSO1, PSO2	Analyze	Conceptual, Procedural

Faculty Members Teaching the Course	Signature
1. Dr. Gaurav Srivastav 2.Dr. Sapna Juneja (NA) 3. Mr. Deepak Tripathi	Gaurav Deepak Tripathi

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 CSE (AIML)

Program Name: CSE-AIML **Academic Session: 2024-25** **Year: 2024** **Semester: V**

Course Name: B.TECH **Course Code: BCAI-501** **Course Coordinator Name: Dr. Gaurav 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	3	2	-	-	-	-	-	-	-	-	-	-	1	2
CO2	3	2	-	1	-	-	-	-	-	-	-	-	1	2
CO3	3	3	3	2	3	2	-	-	-	-	-	-	1	2
CO4	3	3	2	2	3	3	2	-	-	-	-	3	1	2
CO5	3	2	3	3	3	3	2	2	2	-	2	3	1	2
PO Target	3	2.4	2.7	2	3	2.7	2	2	2	NA	2	3	1	2

Faculty Members Teaching the Course	Signature
1. Dr. Gaurav Srivastav 2.Dr. Sapna Juneja (NA) 3. Mr. Deepak Tripathi	Gaurav Deepak Tripathi

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 CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year:2024** **Semester: 5th**
Course Name: Design and Analysis of Algorithm **Course Code: BCS-503** **Course Coordinator Name: Rajeev Kr. Singh**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	To have knowledge of basic principles of algorithm design and Analysis, asymptotic notations and growth of functions for time and space complexity analysis and applying the same in different sorting algorithms like merge sort and quick sort	PO1,PO2,PO3,PO4,PO5,PO9,PO10,PO11,PO12,PSO1	3	C,P
CO2	To apply different problem-solving approaches for advanced data structures.	PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO9,PO10,PO11,PO12,PSO1	3	C,P
CO3	To analyze and apply different optimization techniques like dynamic programming, backtracking and Branch & Bound to solve the complex problems.	PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO9,PO10,PO11,PO12,PSO1	3,4	C,P
CO4	To apply divide and conquer method for solving matrix multiplication and Greedy Algorithm for solving different Graph Problem.	PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO9,PO10,PO11,PO12,PSO1	3	C,P
CO5	To understand the advanced concepts like NP Completeness and Fast Fourier Transform, to analyze and apply String Matching, Approximation and Randomized Algorithms to solve the complex problems	PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO9,PO10,PO11,PO12,PSO1	4	C,P

Faculty Members Teaching the Course	Signature
1. Mr. Gagan Singh 2.Mr. Bhuvnesh Malik 3. Mr. Tanmoy Das	

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

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

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Department of CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2024** **Semester: 5th**
Course Name:Design & Analysis of Algorithm **Course Code: BCS-503** **Course Coordinator Name: Rajeev Kr. Singh**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO/ APO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	3	3	-	-	-	2	2	3	3	3	
CO2	3	3	3	3	3	2	-	1	2	2	3	3	3	
CO3	3	3	3	3	3	2	-	2	2	2	3	3	3	
CO4	3	3	3	3	3	2	-	2	2	2	3	3	3	
CO5	2	2	2	2	2	2	-	2	2	2	3	3	3	
PO Target	2.8	2.8	2.8	2.8	2.8	2	-	1.75	2	2	3	3	3	

Faculty Members Teaching the Course	Signature
1. Mr. Gagan Singh 2. Mr. Bhuvnesh Malik 3. Mr. Tanmoy Das	Bhuvnesh

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

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

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

Department of CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year:2024** **Semester: Vth Course**
Name: Data Analytics **Course Code: BCS-052** **Course Coordinator Name: Mr. Rishabh Sachan**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	Conceptual
CO2	Apply various Data Analysis Techniques.	PO1, PO4, PO5, PO10, PO12, PSO1	Apply	Procedural
CO3	Apply mining techniques on streaming data.	PO1, PO4, PO5, PO10, PO12, PSO1	Apply	Procedural
CO4	Compare different clustering and frequent pattern mining algorithms.	PO1, PO2, PO4, PO5, PO10, PO12, PSO1	Analyze	Procedural
CO5	Apply R tool for developing and evaluating real time applications.	PO1, PO4, PO5, PO10, PO12, PSO1	Apply	Procedural

Faculty Members Teaching the Course	Signature
1. RISHABH SACHAN	

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

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 CSE (AI&ML)

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

Course Name: Data Analytics **Course Code: BCS-052** **Course Coordinator Name: Mr. Rishabh Sachan**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO/ APO	
	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	-
CO4	2	2	-	2	1	-	-	-	-	1	-	2	2	-
CO5	2	-	-	2	1	-	-	-	-	2	-	2	2	-
PO Target(Avg)	2	2	-	2	1	-	-	-	-	1.25	-	2	1.8	-

Faculty Members Teaching the Course	Signature
1. RISHABH SACHAN	

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

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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Department of CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: V**
Course Name: Cloud Computing **Course Code: BCAM051** **Course Coordinator Name: Dr. Laxman Singh**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Describe architecture and underlying principles of cloud computing.	PO1, PO2, PSO2	2	C
CO2	Explain need, types and tools of Virtualization for cloud.	PO1, PO2, PO3, PO4, PSO2	3	P
CO3	Describe Services Oriented Architecture and various types of cloud services.	PO1, PO2, PO3, PO4, PO5, PO6, PSO2	3	P
CO4	Explain Inter cloud resources management cloud storage services and their providers Assess security services and standards for cloud computing	PO1, PO2, PO3, PO4, PO5, PO6, PO12, PSO2	4	P
CO5	Analyze advanced cloud technologies.	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO11, PO12, PSO2	4	P

Faculty Members Teaching the Course	Signature
1. Dr. Laxman Singh 2. Mr. Mukesh	

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

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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Department of CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year:2024** **Semester: V**
Course Name: Cloud Computing **Course Code: BCAM051** **Course Coordinator Name: Dr. Laxman 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	2	-	-	-	-	-	-	-	-	-	-	-	3
CO2	3	2	3	2	-	-	-	-	-	-	-	-	-	3
CO3	3	2	3	2	3	2	-	-	-	-	-	-	-	3
CO4	3	2	3	2	3	2	-	-	-	-	-	2	-	3
CO5	3	2	3	2	3	2	-	2	2	3	3	2	-	3
PO Target	3	2	3	2	3	2	-	2	2	3	3	2	-	3

Faculty Members Teaching the Course	Signature
1. Dr. Laxman Singh 2. Mr. Mukesh	

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

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 CSE (AI&ML)

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

Course Name: Database management system(Lab) **Course Code: BCS-551** **Course Coordinator Name: Dr. Pratibha Singh**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Design logical and conceptual database schema for a real life problem using ERD tool.	PO1,PO2,PO3,PO4,PO5,PO6, PO9,PO10, PO12,PSO1	3,6	C,P
CO2	Implement queries in SQL to store, retrieve, and manipulate data in relational databases.	PO1,PO2,PO3, PO5,PO12,PSO1	3	C,P
CO3	Apply PL/SQL to solve real-world database management and automation tasks.	PO1,PO2,PO3,PO4,PO5, PO9,PO10, PO12,PSO1,PSO2	3	C,P

Faculty Members Teaching the Course	Signature
1. Dr. Pratibha Singh	
2. Ms. Nidhi Singh	
3. Mr. Nagendra Nath Dubey	

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

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.

NIRF-2024
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Department of CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester:5th**
Course Name: Database management system(Lab) **Course Code: BCS-501** **Course Coordinator Name: Dr. Pratibha 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	2	3	2	-	-	2	3	-	3	3	-
CO2	3	2	2	-	3	-	-	-	-	-	-	2	3	-
CO3	3	3	3	2	3	-	-	-	2	1	-	3	3	1
PO Target	3	2.7	2.7	2	3	2	-	-	2	2	-	2.7	3	1

Faculty Members Teaching the Course	Signature
1. Dr. Pratibha Singh	
2. Ms. Nidhi Singh	
3. Mr. Nagendra Nath Dubey	

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

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 CSE (AIML)

Program Name: CSE-AIML **Academic Session: 2024-25** **Year: 2024** **Semester: V**
Course Name: B.TECH **Course Code: BCAI-551** **Course Coordinator Name: Dr. Gaurav Srivastav**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Implement basic search techniques and game theory to solve optimization problems and games.	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PSO1, PSO2	Applying	Procedural
CO2	Design and apply Python programs for knowledge representation and problem-solving using logical reasoning methods like forward and backward chaining.	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PSO1, PSO2	Analyzing	Procedural
CO3	Develop AI models for natural language processing and speech recognition applications using machine learning algorithms.	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PSO1, PSO2	Analyzing	Procedural

Faculty Members Teaching the Course	Signature
1. Dr. Gaurav Srivastav 2.Dr. Sapna Juneja (NA) 3. Mr. Deepak Tripathi	Gaurav Deepak Tripathi

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 CSE (AIML)

Program Name: CSE-AIML
Course Name: B.TECH

Academic Session: 2024-25
Course Code: BCAI-551 Course

Year: 2024
Coordinator Name: Dr. Gaurav Srivastav

Semester: V

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	2	2	-	-	-	1	2	1	1	1	2
CO2	2	2	2	2	1	-	-	-	1	2	2	1	1	2
CO3	2	2	2	2	2	-	-	-	1	2	1	1	1	2
PO Target	2	2	1.7	2	1.7				1	2	1.3	1	1	2

Faculty Members Teaching the Course	Signature
1. Dr. Gaurav Srivastav 2.Dr. Sapna Juneja (NA) 3. Mr. Deepak Tripathi	Gaurav Deepak Tripathi

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).

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Pharmacy Rank - 77
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Department of CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester:5th**
Course Name: Design & Analysis of Algorithm **Course Code: BCS-503** **Course Coordinator Name: Rajeev Kr. Singh**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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,PO9,PO10,PO12,PSO1	2,4	C,P
CO2	Implement algorithm to solve problems by divide and conquer approach	PO1,PO2,PO3,PO4,PO9,PO10,PO12,PSO1	3,5	C,P
CO3	Implement algorithm to solve problems by Greedy algorithm approach.	PO1,PO2,PO3,PO4,PO9,PO10,PO12,PSO1	4,5	C,P
CO4	Implement algorithm to solve problems by Dynamic programming, backtracking, branch and bound approach.	PO1,PO2,PO3,PO4,PO9,PO10,PO12,PSO1	4,5	C,P

Faculty Members Teaching the Course	Signature
1. Mr. Gagan Singh	
2. Mr. Bhuvnesh Malik	Bhuvnesh
3. Mr. Tanmoy Das	

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

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.

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Department of CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year:2024** **Semester:5th**
Course Name: Design & Analysis of Algorithm **Course Code:BCS-503** **Course Coordinator Name: Rajeev Kr. 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	2	3	2	-	-	-	-	1	-	-	1	3	-
CO2	2	2	2	2	-	-	-	-	1	-	-	1	3	-
CO3	3	3	3	3	-	-	-	-	1	-	-	1	3	-
CO4	3	3	2	3	-	-	-	-	1	-	-	1	3	-
CO5	2	3	2	3	-	-	-	-	1	-	-	1	3	-
PO Target	2.4	2.6	2.4	2.6	-	-	-	-	1	-	-	1	3	-

Faculty Members Teaching the Course	Signature
1. Mr. Gagan Singh 2.Mr. Bhuvnesh Malik 3. Mr. Tanmoy Das	Bhuvnesh

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

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 CSE (AI&ML)

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

Course Name: Mini Project Lab **Course Code: BCS-554** **Course Coordinator Name: Mr. Bhuvnesh Malik**

Course Outcomes:

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Formulate a well-defined problem statement and systematically gather comprehensive functional and non-functional requirements for effective solution design.	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12, PSO1, PSO2	2, 4	C, P
CO2	Leverage acquired knowledge to develop a sustainable and optimized solution by employing the latest tools and techniques, adhering to industry standards and best practices in computing.	PO1, PO2, PO3, PO4, PO5, PO7, PO8, PO9, PO11, PO12, PSO1, PSO2	4, 5	C, P
CO3	Implement and thoroughly integrate the developed solution using contemporary technologies and frameworks, ensuring high functionality, efficiency, and adherence to project specifications.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO11, PO12, PSO1, PSO2	3, 5, 6	C, P
CO4	Develop vital professional competencies and critical analytical skills to strategically prepare for and manage the intricacies of major projects, promoting effective decision-making.	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12, PSO1, PSO2	4, 5	C, P
CO5	Develop and demonstrate essential professional skills, including leadership, ethical decision-making, effective listening, teamwork, and positive workplace attitudes to achieve project goals and enhance professional readiness.	PO1, PO5, PO8, PO9, PO10, PO11, PO12, PSO1, PSO2	4, 5	C, P

Faculty Members Teaching the Course	Signature
1. Mr. Bhuvnesh Malik	

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.
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Department of CSE (AI&ML)

Program Name: B.Tech.
Course Name: Mini Project Lab

Academic Session: 2024-25 **Year: 2024** **Semester: 5th**
Course Code: BCS-554 **Course Coordinator Name: Mr. Bhuvnesh Malik**

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	-	3	2	2	2	3	2	2
CO2	3	3	3	3	3	-	2	3	2	-	2	3	2	3
CO3	3	3	3	3	3	1	2	-	3	-	2	2	3	2
CO4	3	3	3	3	3	2	-	2	3	2	2	3	2	2
CO5	2	-	-	-	3	-	-	2	2	3	2	3	2	2
PO Target	2.8	3.0	3.0	3.0	3.0	1.67	2.0	2.5	2.4	2.33	2.0	2.8	2.2	2.2

Faculty Members Teaching the Course	Signature
1. Mr. Bhuvnesh Malik	

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).

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DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY LUCKNOW

B.Tech. 4th Year

Computer Science and Engineering (Artificial Intelligence and Machine Learning)

CURRICULUM STRUCTURE

SEMESTER- VII

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KHU701/KHU702	HSMC -1 / HSMC-2	3	0	0	30	20	50		100		150	3
2	Dept. Elective-IV	Departmental Elective-IV	3	0	0	30	20	50		100		150	3
3	Dept. Elective-V	Departmental Elective-V	3	0	0	30	20	50		100		150	3
4	KOE07X	Open Elective-II	3	0	0	30	20	50		100		150	3
5	KCS751A	Departmental Elective Lab**	0	0	2				25		25	50	1
6	KCS752	Mini Project or Internship Assessment*	0	0	2				50			50	1
7	KCS753	Project	0	0	8				150			150	4
8		MOOCs (Essential for Hons. Degree)											
		Total	**12**	**0**	**12**							**850**	**18**

*The Mini Project or internship (4 - 6 weeks) conducted during summer break after VI semester and will be assessed during VII semester.

SEMESTER- VIII

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KHU801/KHU802	HSMC-1/HSMC-2	3	0	0	30	20	50		100		150	3
2	KOE08X	Open Elective-III	3	0	0	30	20	50		100		150	3
3	KOE09X	Open Elective-IV	3	0	0	30	20	50		100		150	3
4	KCS851	Project	0	0	18				100		300	400	9
5		MOOCs (Essential for Hons. Degree)											
		Total	**9**	**0**	**18**							**850**	**18**

** Department may conduct one Lab of based on either Data Mining & Warehousing or Cloud Computing.

Departmental Elective-IV

1. KAI071 Optimization in Machine Learning
2. KCS072 Natural language processing
3. KAI073 Text Analytics and Natural Language Processing
4. KCS074 Cryptography and Network Security
5. KAI075 Data Warehousing and Data Mining
6. KAI076 Time series analysis and Forecasting
7. KAI077 Software Engineering

Departmental Elective-V

1. KAI078 Nature-Inspired Computing
2. KAI079 Distributed Computing System
3. KCS710 Quantum Computing
4. KCS711 Mobile Computing
5. KCS712 Internet of Things
6. KCS713 Cloud Computing
7. KCS714 Blockchain Architecture Design

Department of CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: 7th**
Course Name: Project Management and Entrepreneurship **Course Code: KHU-702** **Course Coordinator Name: Ms. Payal Chhabra**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	2	Factual
CO2	Create innovative business ideas and market opportunities for business development.	PO6, PO9, PO11,PSO1	2	Conceptual
CO3	Understand the importance of Project life cycle and different types of appraisal techniques.	PO6, PO7, PO9, PO10, PO11, PO12	2	Conceptual
CO4	Define different types of project financing requirements on the basis of cash flow statements.	PO6, PO9, PO10, PO11, PO12	3	Procedural
CO5	Describe social entrepreneurship opportunities and risk management techniques in social enterprises.	PO6, PO7, PO9, PO11, PO12	2	Conceptual

Faculty Members Teaching the Course	Signature
1. Ms. Payal Chhabra	

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

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 CSE (AI&ML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: 7th**
Course Name: Project Management and Entrepreneurship **Course Code: KHU-702** **Course Coordinator Name: Ms. Payal Chhabra**

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	-	-	-
CO2	-	-	-	-	-	1	-	-	1	-	1	-	2	-
CO3	-	-	-	-	-	2	1	-	2	1	1	1	-	-
CO4	-	-	-	-	-	1	-	-	2	2	2	1	-	-
CO5	-	-	-	-	-	2	2	-	2	-	1	1	-	-
PO Target	-	-	-	-	-	1.4	1.5	-	1.8	1.5	1.4	1	-	-

Faculty Members Teaching the Course	Signature
1. Ms. Payal Chhabra	

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

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 CSE (AIML)

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

Course Name: Data Warehousing & Data Mining **Course Code: KAI075** **Course Coordinator Name: Mr Abhishek Shukla**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Be familiar with mathematical foundations of data mining tools	PO1,PO2,PO3,PO4,PO5,PO6,PO10,PO12,PSO1	1,2	C,P
CO2	Understand and implement classical models and algorithms in data warehouses and data mining	PO1,PO2,PO3,PO4,PO5,PO6,PO6,PO7,PO11,PO12, PSO1,PSO2	3	F,C
CO3	Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.	PO1,PO2,PO3,PO4,PO5,PO6,PO6,PO9,,PO11,PO12, PSO1	1,2	C,P
CO4	Master data mining techniques in various applications like social, scientific and environmental context.	PO1,PO2,PO3,PO4,PO5,PO6,PO6,PO7,PO9,PO10,P O11,PO12,PSO1,PSO2	3	C,P
CO5	Develop skill in selecting the appropriate data mining algorithm for solving practical problems.	PO1,PO2,PO3,PO4,PO5,PO6,PO6,PO7,PO9,PO10,P O11,PO12,PSO1,PSO2	1,2	P,M

Faculty Members Teaching the Course	Signature
1. Mr Abhishek Shukla	

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

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

NIRF-2024
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Pharmacy Rank - 77
Innovation Rank Band (11-50)

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Department of CSE (AIML)

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

Course Name:Data Warehousing & Data Mining **Course Code: KAI075** **Course Coordinator Name: Mr Abhishek Shukla**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO/ APO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	2	1	3	1	-	-	-	2	-	3	3	-
CO2	3	3	3	2	3	1	3	-	-	-	1	2	3	3
CO3	3	3	3	2	3	1	-	-	2	-	1	2	3	-
CO4	3	3	3	3	3	1	3	-	3	3	2	2	3	3
CO5	3	3	3	3	3	1	3	-	3	3	2	3	3	3
PO Target	3	3	2.8	2.2	3	1	3	-	2.6	2.6	1.5	2.4	3	3

Faculty Members Teaching the Course	Signature
1.Mr Abhishek Shukla	

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

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 CSE (AI)

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

Course Name: Mobile Computing **Course Code: KCS711** **Course Coordinator Name: Richa Singh**

Course Objective:

The objective is to equip students with a thorough understanding of key issues, concepts, and technologies in mobile computing. Students will develop the skills to analyze wireless networking, data management, security, and various routing protocols, preparing them to address challenges in mobile computing environments.

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO 1	**Understand** issues in mobile computing and illustrate an overview of wireless telephony and channel allocation in cellular systems.	PO- 1,2, 10,11,12 / PSO-2	Understand	C, P
CO 2	**Analyze** the concept of Wireless Networking and Wireless LAN.	PO- 1, 2,3, 4, 6, 10,11,12 / PSO-2	Analyze	C, P
CO 3	**Analyse** and comprehend Data management issues like data replication for mobile computers, adaptive clustering for mobile wireless networks and Disconnected operations.	PO- 1, 2,3, 4, 5, 6, 10, 11, 12 / PSO-2	Analyze	C, P
CO 4	**Understand** Mobile computing Agents and state the security and fault tolerance issues in mobile computing environment.	PO- 1, 2, 3, 4, 5, 6, 7, 8,9,10,11,12 / PSO-2	Understand	C, P
CO 5	**Apply** various routing protocols and identify and interpret the performance of network systems using Adhoc networks.	PO- 1, 2, 3, 5, 6, 10,11, 12 / PSO-2	Apply	C, P

Faculty Members Teaching the Course	Signature
1. Ms. Richa Singh	Richa Singh

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

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.

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Department of CSE (AI)

Program Name: B.Tech
Course Name: Mobile Computing

Academic Session: 2024-25
Course Code:KCS711

Year:4th **Semester:7th**
Course Coordinator Name: Richa 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	1	1	1	1
CO2	3	3	1	2	-	1	-	-	-	3	1	3	1	1
CO3	3	3	3	2	3	1	-	-	-	3	1	3	-	-
CO4	3	3	1	2	3	2	2	2	2	2	1	3	-	-
CO5	3	2	3	-	3	2	-	-	-	2	1	3	1	1
PO Target	3	2.8	2	2	3	1.5	2	2	2	2.6	1	2.6	1	1

Faculty Members Teaching the Course	Signature
1. Richa Singh	

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

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 & Engineering (Artificial Intelligence & Machine Learning)

Program Name: B.Tech **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: Internship Assessment **Course Code: KCS752** **Course Coordinator Name: Ms. Payal Chhabra**

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

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

Department of Computer Science & Engineering (Artificial Intelligence & Machine Learning)

Program Name: B.Tech **Academic Session: 2024-25** **Year: 4th** **Semester: 7th**
Course Name: Internship Assessment **Course Code: KCS752** **Course Coordinator Name: Ms. Payal Chhabra**

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**

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

Department of Computer Science & Engineering(Artificial Intelligence)

Program Name: B.Tech. **Academic Session:2024-25** **Year:4th** **Semester: 7th**
Course Name: Internship Assessment **Course Code: KCS752** **Course Coordinator Name: Dr. Richa 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, 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

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

Department of Computer Science & Engineering(Artificial Intelligence)

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

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

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Department of CSE (AIML)

Program Name: B.Tech **Academic Session: 2024-25** **Year:IV** **Semester: VII**
Course Name: RER **Course Code: KOE 074** **Course Coordinator Name:Prof. Varun Sharma**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	**Understand** various non-conventional energy resources and their availability along with knowledge on solar cells.	PO1, PO4, PO6, PO7, PO10, PO12	2	Factual
CO2	**Apply** the concept of solar radiation on flat plate and focusing type collectors to convert solar energy into electrical energy.	PO1, PO4, PO6, PO7, PO10, PO12	3	Conceptual
CO3	**Understand** the concept of electrical energy generation from geothermal energy, magneto-hydro dynamics and fuel cells.	PO1, PO4, PO6, PO7, PO10, PO12	2	Conceptual
CO4	**Understand** the concept of electrical energy generation from thermo- electrical, thermionic and wind energy conversions.	PO1, PO4, PO6, PO7, PO10, PO12	2	Conceptual
CO5	**Understand** biomass, ocean thermal, wave and tidal wave energy conversions.	PO1, PO4, PO6, PO7, PO10, PO12	2	Conceptual

Faculty Members Teaching the Course	Signature
1. Dr. Masood Rizvi	

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

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

Department of CSE (AIML)

Program Name: B.Tech **Academic Session: 2024-25** **Year:IV** **Semester: VII**
Course Name: RER **Course Code: KOE 074** **Course Coordinator Name:Prof. Varun Sharma**

CO - PO/PSO/APO Matrix

CO No.	Programme Outcome (PO)												PSO/APO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1			1		2	3			1		1		
CO2	3			2		3	3			1		2		
CO3	1			2		2	3			1		2		
CO4	1			2		2	3			1		2		
CO5	1			2		2	3			1		2		
PO Target	1.4			1.8		2.2	3			1		1.8		

Faculty Members Teaching the Course	Signature
1. Dr. Masood Rizvi	

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

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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Department of CSE (AIML)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: 7th**
Course Name: Data Warehousing & Data Mining LAB **Course Code: KCS- 751A** **Course Coordinator Name: Mr Abhishek Shukla**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Students understand the various issues while handling the data. They are able to analyze the raw data to make it suitable for various data mining algorithms.	PO1,PO2,PO3,PO4,PO5,PO6,PO6,PO7,PO8,PO9,PO10,PO12,PSO2	2,4	C,P
CO2	Students well versed in all data mining algorithms, methods of evaluation. Students are able to implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.	PO1,PO2,PO3,PO4,PO5,PO6,PO6,PO7,PO9,PSO1,PSO2	2,4,5	C,P
CO3	Students are able to use commercially available softwares for data mining. They can analyze the problem domain, use the data collected in enterprise, interpret and visualize the results.	PO2,PO3,PO4,PO5,PO6,PO6,PO7,PO8,PO9,PO11,PO12,PSO1,PSO2	5,6	P,M

Faculty Members Teaching the Course	Signature
1. Mr Abhishek Shukla	

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

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

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Department of CSE (AIML)

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

Course Name:Data Warehousing & Data Mining LAB **Course Code:KCS- 751A** **Course Coordinator Name: Mr Abhishek Shukla**

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	3	3	2	2	-	3	-	2
CO2	3	3	3	3	3	3	2	-	2	-	-	-	2	2
CO3	-	2	3	2	3	2	2	3	2	-	2	3	2	3
PO Target	3	2.67	3	2.67	3	2.33	2.33	2	2	2	2	3	2	2.33

Faculty Members Teaching the Course	Signature
1.Mr Abhishek Shukla	

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

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).

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Department of CSE (AIML)

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

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 C 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
1. Ms. Bhawna	21/10/24

21/10/24

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

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 CSE (AIML)

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

Course Name: Project Lab **Course Code:** KCS753 **Course Coordinator Name:** Ms. Bhawna

CO - PO/PSO 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
Ms. Bhawna	21/10/24

21/10/24

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

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

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EVALUATION SCHEME

Effective from the Session: 2024-25

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B.Tech (CSE(AI)/CSE(AIML)) 1st Sem

S No.	Course Type	BOS	Subject Code	Subject Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total	Credits
						L	T	P	MSE	CA	TOTAL		CIE+ESE	
1	BS	AS	K24AS11	Calculus for Engineers	T	3	1	0	80	20	100	100	200	4
2	BS	AS	K24AS12/ K24AS13	Semiconductor Physics and Devices / Environmental Chemistry	T	3 2	0 0	0 0	60 40	15 10	75 50	75 50	150 100	3 2
3	ES	IT	K24IT11	Programming For Problem Solving	T	3	0	0	60	15	75	75	150	3
4	PC	AS/ EC	K24AS14/ K24EC11	Discrete Structures & Theory of Logic/ Computer Organization & Logic Design	T	3	0	0	60	15	75	75	150	3
5	ES/PC	EEE/ CSE(AI)	K24EEE11/ K24AI11	IoT and Embedded Systems/ Introduction to AI	T	2	0	0	40	10	50	50	100	2
6	ES	CSIT	K24CSIT11	Design Thinking	T	1	0	0	40	10	50	-	50	1
7	BS/PC	AS/EC	K24AS12P/ K24EC11P	Semiconductor Physics and Devices Lab/ Computer Organization & Logic Design Lab	L	0	0	2	-	25	25	25	50	1
8	ES	IT	K24IT11P	Programming For Problem Solving Lab	PBL	0	0	4	-	50	50	50	100	2
9	ES/PC	EEE/ CSE(AI)	K24EEE11P/ K24AI11P	IoT and Embedded Systems Lab/ Introduction to AI Lab	PBL	0	0	2	-	25	25	25	50	1
10	PC	IT	K24IT12P	Web Designing Lab	PBL	0	0	2	-	50	50	-	50	1
11	HS	HSS	K24HS11P / K24HS12P	Communication Skills / Foreign Language	B	0	0	4	80	20	100	-	100	2
12	MC	SW	K24SW11/K24SW12	Self-Growth/ Indian Knowledge System	B	0	0	2	-	-	-	-	-	NC
13	MC	HSS	K24HS13	Career Pathway*	-	0	0	2*	-	-	-	-	-	NC
14	MC	EEE	K24EEE12	Ethics & Professional Competency*	-	0	0	2*	-	-	-	-	-	NC
Total Hours = 32 hrs.						15	1	16	420	255	675	475	1150	23

- Design Thinking, IoT and Embedded Systems, Self-Growth, Indian Knowledge System and Web Designing Lab will be evaluated through activity-based assessments
- Self-Growth: Yoga Activities/ NSS/NCC/Sports
- Indian Knowledge System: Indian Aesthetics (including Music and Music Instruments)/ Strategic Lessons from Bhagavad Gita/Leadership from Ramayana/Ayurved/Astronomy/ Astrology/Indian Vision for Human Society (Vishva Kalyan thru Vasudhaiva Kutumbkam)/Sanskrit/ Vedic Math/ Classical Dance.
- *Career pathway and Ethics & Professional Competency to be covered in the Induction program and will be evaluated through activity-based assessments
- Foreign Language will be given on performance based for which assessment shall be done during Induction

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Department of CSE (AI&ML)

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

Course Name: Calculus for Engineers **Course Code: K24AS11** **Course Coordinator Name: Dr. Sachin Kumar**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	3	Conceptual, Procedural
CO2	**Apply** knowledge of partial differentiation in extrema, series expansion of functions and Jacobians.	PO1, PO2, PO3, PO8, PO12	3	Conceptual, Procedural
CO3	**Construct** the transformations using the concept of analyticity and harmonicity of complex functions.	PO1, PO2, PO3, PO8, PO12	3	Conceptual, Procedural
CO4	**Employ** the concept of multiple integration to find the area of bounded region.	PO1, PO2, PO3, PO8, PO12	3	Conceptual, Procedural
CO5	**Apply** the concept of vector differentials to study the properties of point functions.	PO1, PO2, PO3, PO8, PO12	3	Conceptual, Procedural

Faculty Members Teaching the Course	Signature
1. Dr. C. M. Batra 2. Dr. Barkha Rohtagi	

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

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.

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

Course Name: Calculus for Engineers **Course Code: K24AS11** **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 (Avg.)	**2.4**	**2**	**2**	-	-	-	-	**1**	-	-	-	**1.4**	-	-

Faculty Members Teaching the Course	Signature
1. Dr. C. M. Batra 2. Dr. Barkha Rohtagi	

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

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

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Department of CSE (AI&ML)

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

Course Name: Discrete Structure and Theory of Logics **Course Code: K24AS14** **Course Coordinator Name: Dr. Deepti Seth**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	Conceptual, Procedural
CO2	Apply fundamental concepts of functions and Boolean algebra in logical reasoning and computational abilities.	PO1, PO2, PO3, PO8, PO12	3	Conceptual, Procedural
CO3	Employ the rules of propositions, theory of inferences and predicate logic in logical reasoning problems.	PO1, PO2, PO3, PO8, PO12	3	Conceptual, Procedural
CO4	Understand the concepts of algebraic structures and their applications to apply in critical thinking	PO1, PO2, PO3, PO8, PO12	3	Conceptual, Procedural
CO5	Apply the concept of graph theory in solving shortest path engineering problems	PO1, PO2, PO3, PO8, PO12	3	Conceptual, Procedural

Faculty Members Teaching the Course	Signature
1. Dr. Sanjay Garg 2. Dr. Richa Aggarwal 3. Dr. Garima Bisht 4. Dr. Deepti Seth	Richa

Signature of Course Coordinator Assoc./ Asstt. Head DOC Signature of Addl. HoD Signature of Dean

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.

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Department of CSE (AIML)

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

Course Name:Discrete Structure and Theory of Logics **Course Code:K24AS14** **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	2	2	-	-	-	-	1	-	-	-	1	-	-
CO2	2	2	2	-	-	-	-	1	-	-	-	1	-	-
CO3	3	1	2	-	-	-	-	1	-	-	-	1	-	-
CO4	2	2	2	-	-	-	-	1	-	-	-	2	-	-
CO5	3	2	2	-	-	-	-	1	-	-	-	2	-	-
PO Target (Avg.)														

Faculty Members Teaching the Course	Signature
1. Dr. Sanjay Garg 2. Dr. Richa Aggarwal 3. Dr. Garima Bisht 4. Dr. Deepti Seth	Richa Garima.

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

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 CSE (AI&ML)

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**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	**Understand** the basic concepts of sensors and transducers.	PO- 1, 5, 6, 7, 12 / PSO-2	Understand	C, P
CO2	**Understand** the basics of embedded systems and different IoT boards.	PO- 1, 3, 5, 6, 7, 9, 12 / PSO-2	Understand	C, P
CO3	**Apply** basic operations and programming techniques of IoT devices.	PO- 1, 3, 4, 5, 6, 7, 9, 12 / PSO-2	Apply	C, P
CO4	**Apply** smart technology knowledge through case studies.	PO- 1, 2, 3, 4, 5, 6, 7, 9, 12 / PSO-2	Apply	C, P

Faculty Members Teaching the Course	Signature
1. Dr. Bandana 2. Dr. Dr. Ankur Maheshwari	

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

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).

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Department of CSE (AI&ML)

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
CO5	2.5	2	2.66	2.5	2.5	2	2		2			2		2.5
PO Target (Avg.)	2	-	-	-	2	2	2	-	-	-	-	2	-	2

Faculty Members Teaching the Course	Signature
1. Dr. Bandana 2. Dr. Ankur Maheshwari	

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

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

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Department of CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year:2024** **Semester: I**
Course Name: IoT and Embedded Systems Lab **Course Code: K24EEE11P** **Course Coordinator Name: Prof. Salim**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	**Understand** the basic concepts of sensors and transducers.	PO- 1, 5, 6, 7, 12 / PSO-2	Understand	C, P
CO2	**Understand** basics of embedded system and different IoT boards.	PO- 1, 3, 5, 6, 7, 9, 12 / PSO-2	Understand	C, P
CO3	**Apply** basic operations and programming techniques of IoT devices.	PO- 1, 3, 4, 5, 6, 7, 9, 12 / PSO-2	Apply	C, P
CO4	**Apply** smart technology knowledge through case studies.	PO- 1, 2, 3, 4, 5, 6, 7, 9, 12 / PSO-2	Apply	C, P

Faculty Members Teaching the Course	Signature
1. Dr. Bandana 2. Dr. Ankur Maheshwari	

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

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 CSE (AI&ML)

Program Name: B.Tech **Academic Session: 2024-25** **Year: 2024** **Semester: I**
Course Name: IoT and Embedded Systems Lab **Course Code: K24EEE11P** **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 (Avg.)	2.5	2	2.66	2.5	2.5	2	2		2			2		2.5

Faculty Members Teaching the Course	Signature
1. Dr. Bandana 2. Dr. Ankur Maheshwari	

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

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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Department of CSE (AI&ML)

Program Name: B.Tech.
Academic Session: 2024-25 **Year: 2024** **Semester: I**
Course Name: Web Designing Workshop **Course Code: K24IT12P** **Course Coordinator Name: Mr. Shivansh Prasad**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO 1	Understand the concept of layout and structure of Hypertext markup language (HTML)	PO- 1,2,3,4,5,6,7,8,9,10,11,12 / PSO-1	Remember	C, P
CO 2	Apply the integration of Cascading style sheets (CSS) in HTML pages.	PO- 1,2,3,4,5,6,7,8,9,10,11,12 / PSO-1	Understand	C, P
CO 3	Apply the JavaScript concept to process and validate the data of a web page on client Machine.	PO- 1,2,3,4,5,6,7,8,9,10,11,12 / PSO-1	Understand	C, P
CO 4	Design the website with the application of HTML, CSS and JavaScript.	PO- 1,2,3,4,5,6,7,8,9,10,11,12 / PSO-1	Create	C, P

Faculty Members Teaching the Course	Signature
1. Mr. Shivansh Prasad 2. Mr. Mayank Lakhotia 3. Mr. Sahil Bhatia	Sahil

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

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).

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Department of CSE (AIML)

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

Course Name: Web Designing Workshop **Course Code: K24IT12P** **Course Coordinator Name: Mr. Shivansh Prasad**

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	1	1	1	2	1	2	3	2	-
CO2	1	1	2	1	1	1	1	1	2	1	1	3	3	-
CO3	3	2	2	2	2	1	1	1	2	1	2	3	3	-
CO4	3	3	3	3	3	2	1	1	3	2	2	3	3	-
CO5														
PO Target (Avg.)	2.25	2	2.25	1.75	2	1.25	1	1	2.25	1.25	1.75	3	2.75	-

Faculty Members Teaching the Course	Signature
1. Mr. Shivansh Prasad 2. Mr. Mayank Lakhotia 3. Mr. Sahil Bhatia	

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

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 CSE (AI&ML)

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

Course Name: Communication Skills **Course Code: K24ASH11P** **Course Coordinator Name: Dr Babita Tyagi**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO 1	To develop the Listening skills in professional setting.	PO10,PO12	Apply	C, P
CO 2	Apply correct English usage and formal style of writing .	PO10,PO12	Apply	C, P
CO 3	Analyze the usage of verbal and non-verbal cues in presentation and day-to-day communication.	PO10,PO12	Analyze	C, P
CO 4	Evaluate Communication skills with respect to the nature and objectives of workplace .	PO10,PO12	Evaluate	C, P

Faculty Members Teaching the Course	Signature
1. Dr Babita Tyagi/ Dr Vipin Kumar	

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

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.

Department of CSE (AI&ML)

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

Course Name: Communication Skills **Course Code:K24ASH11P** **Course Coordinator Name: Dr Babita Tyagi**

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		
PO Target (Avg.)										2.4		8		

Faculty Members Teaching the Course	Signature
1. Dr Babita Tyagi 2. Dr Vipin Kumar	

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

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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Department of CSE (AI&ML)

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

Course Name: Design Thinking **Course Code:K24CSIT11** **Course Coordinator Name:Dr. Rekha Kashyap**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	Statement of Course Outcome			
CO1	Understand the basic requirements of a good design.	PO- 1,2,3,4,5,6,7,9,10,12 / PSO-1	Understand	C, P
CO2	Empathise and ideate the solutions to problems in user environment	PO- 1,2,3,4,5,6,7,9,10,12 / PSO-1	Apply	C, P
CO3	Prototype and test the developed solutions.	PO- 1,2,3,4,5,6,7,9,10,12 / PSO-1	Apply	C, P
CO4	Apply the principles of design thinking on developing innovative solutions to the real world problems.	PO- 1,2,3,4,5,6,7,9,10,12 / PSO-1	Create	C, P

Faculty Members Teaching the Course	Signature
1. Dr. Rekha Kashyap 2. Mr. Shivansh Prasad 3. Mr. Mayank Lakhotia 4. Mr. Sahil Bhatia 5. Ms. Nishtha Negi	

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

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 CSE (AI&ML)

Program Name: B.Tech.
Course Name: Design Thinking

Academic Session: 2024-25
Course Code:K24CSIT11

Year: 2024 **Semester: I**
Course Coordinator Name:Dr. Rekha Kashyap

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	3	3	2	2	2	2	-	2	2	-	3	3	-
CO2	1	3	3	2	2	2	2	-	2	2	-	2	3	-
CO3	1	3	3	2	2	2	2	-	2	2	-	2	3	-
CO4	1	3	3	2	2	2	2	-	2	2	-	2	3	-
PO Target(Avg)	1	3	3	2	2	2	2	-	2	2	-	2.25	3	-

Faculty Members Teaching the Course	Signature
1. Dr. Rekha Kashyap 2. Mr. Shivansh Prasad 3. Mr. Mayank Lakhotia 4. Mr. Sahil Bhatia 5. Ms. Nishtha Negi	

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

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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Department of CSE (AI&ML)

Program Name: CSE(AI), CSE(AI&ML), CS, ELCE, ME **Academic Session: 2024-25** **Year: 2024** **Semester: I**

Course Name: B.TECH **Course Code: K24AS12 & K24AS12P**

Course Coordinator Name: Dr. Dhirendra Kumar Sharma

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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.	PO 1,2,6,7,10,12	Illustrate	Conceptual, Procedural
CO2	Apply the fundamentals of basic semiconductor Physics on transistor and MOSFET.	PO-1,2,6,7,10,12	Apply	Conceptual, Procedural
CO3	Apply the concepts of semiconductor Physics in aspect of solar cell and Zener diode.	PO-1,2,6,7,10,12	Apply	Conceptual, Procedural
CO4	Implementing of semiconductor Physics to study various characteristics of optoelectronic devices.	PO-1,2,6,7,10,12	Implementing	Conceptual, Procedural
CO5	Apply the concept of Quantum Physics to study various phenomenon.	PO-1,2,10,12	Apply	Conceptual, Procedural

Faculty Members Teaching the Course	Signature
1. Dr. Vipin Kumar, 2. Dr. Dhirendra Kumar Sharma, 3. Dr. Kapil Kumar Sharma 4. Dr. Soniya Juneja, 5. Dr. Bhagwanti Bishnoi, 6. Dr Deepti Chadhuary 7. Mr. Vaibhav Sharma	

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

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).

Condition and Criteria

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Department of CSE (AI&ML)

Program Name: CSE(AI), CSE(AI&ML), CS, ELCE, ME **Academic Session: 2024-25** **Year: 2024** **Semester: I**
Course Name: B.TECH **Course Code:K24AS12**
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
1. Dr. Vipin Kumar, 2. Dr. Dhirendra Kumar Sharma, 3. Dr. Kapil Kumar Sharma 4. Dr. Soniya Juneja, 5. Dr. Bhagwanti Bishnoi, 6. Dr Deepti Chadhuary 7. Mr. Vaibhav Sharma	

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

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

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Department of CSE (AI&ML) / CSE (AI)

Program Name: B.Tech. **Academic Session: 2024-25** **Year: 2024** **Semester: 1st**
Course Name: *Programming for Problem-Solving* **Course Code:** K24IT11 **Course Coordinator Name: Mr. Dinesh Kumar**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	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	Conceptual, Procedural
CO2	Use the concepts of looping, branching, and decision-making statements for a given problem	PO1, PO2, PO4, PO5, PO8, PO12, PSO2	Apply	Conceptual, Procedural
CO3	Develop Solutions to problems using modular programming constructs such as functions and recursion	PO1, PO2, PO4, PO5, PO8, PO12, PSO2	Create	Conceptual, Procedural, metacognitive
CO4	Demonstrate the ability to write C programs using pointers, strings , structures and unions.	PO1, PO2, PO3, PO4, PO5, PO8, PO12, PSO2	Apply	Conceptual, Procedural
CO5	Design a solution to problems using the concepts of pointers and files handling	PO1, PO2, PO3, PO4, PO5, PO8, PO12, PSO2	Create	Conceptual, Procedural, metacognitive

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

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.
- The statement of a CO must be formed
  Condition and Criteria

Department of CSE (AI&ML) / CSE (AI)

	Programme Outcome (PO) [THEORY]												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
1. Mr. Anurag Gupta	
2. Ms. Kumud Alok	Kumud Alok
3. Ms. Ruchika M Daniel	
4. Ms. Aastha Gupta	

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

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).
- The statement of a CO must be formed considering a proper Condition and Criteria.

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NIRF-2024
Engineering Rank Band (151-200)
Pharmacy Rank - 77
Innovation Rank Band (11-50)

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Department of CSE (AI&ML) / CSE (AI)

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

Course Name: *Programming for Problem-Solving* Lab **Course Code: K24IT11P** **Course Coordinator Name: Mr. Dinesh Kumar**

Course Outcomes

After completion of the course, the student will be able to		Relevant POs/ PSOs/ APOs	Revised Bloom's Level (BL)	Knowledge Category (KC)
CO No.	**Statement of Course Outcome**			
CO1	Demonstrate the basic syntax, data types, and control structures of the C programming language	PO1, PO2, PO5, PO8, PO12, PSO2	Apply	Conceptual, Procedural
CO2	Apply the concepts of variables, operators, loops, and conditional statements to solve programming problems	PO1, PO2, PO4, PO5, PO8, PO12, PSO2	Apply	Conceptual, Procedural
CO3	Code arrays and memory management concepts, including dynamic memory allocation and deallocation, using functions like malloc() and free( )	PO1, PO2, PO4, PO5, PO8, PO12, PSO2	Create	Conceptual, Procedural, metacognitive
CO4	Demonstrate proficiency in file handling operations, such as reading from and writing to files using C programming language.	PO1, PO2, PO3, PO4, PO5, PO8, PO12, PSO2	Apply	Conceptual, Procedural
CO5	Develop skills in problem-solving, algorithmic thinking, and logical reasoning through project based learning .	PO1, PO2, PO3, PO4, PO5, PO8, PO12, PSO2	Create	Conceptual, Procedural, metacognitive

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

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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Department of CSE (AI&ML) / CSE (AI)

	Programme Outcome (PO) [LAB]												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
1. Mr. Anurag Gupta	
2. Ms. Kumud Alok	Kumud Alok
3. Ms. Ruchika	
4. Ms. Aastha	

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

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

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