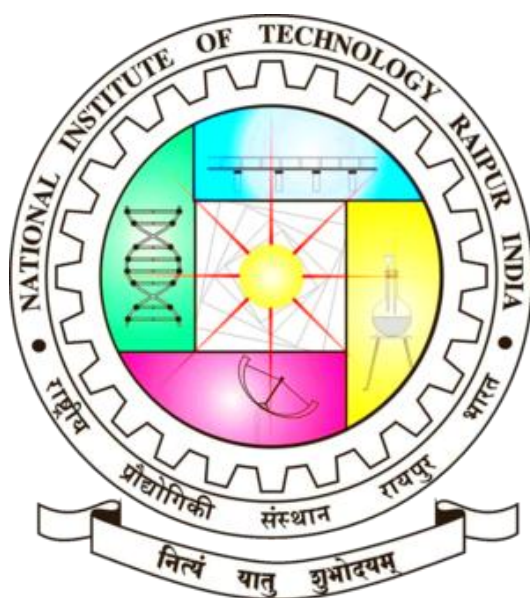


CURRICULUM & SYLLABI
M.Tech. (AI & DS)
COMPUTER SCIENCE & ENGINEERING
Effective from AY: 2026-27



NATIONAL INSTITUTE OF TECHNOLOGY
RAIPUR
RAIPUR, CHHATTISGARH

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Vision and Mission of the Institute (National Institute of Technology Raipur)

VISION

To be a leader in technical and management education in India and to establish a unique identity for the development of high-quality human and knowledge resource in diverse area of technology and management.

MISSION

To re-engineer the engineering education and to mold young students into rational thinking engineers who are motivated by a passion for professional excellence driven by human values and proactively engaged in betterment of society.

Vision and Mission of the Department (Computer Science & Engineering)

VISION

- To promote Research and Development in the frontier areas of Computer Science & Engineering.
- To generate Competent Professionals to become part of the industry and Research Organizations at the National and International levels.
- To provide necessary strengths to enable the students to Innovate and to become Entrepreneurs.

MISSION

- To impart effective education at undergraduate levels in the field of Computer Science and Engineering.
- To conduct Research and Development and offer consultancy services.
- To improve continuously the quality of teaching-learning process.
- To strive steadily for the overall growth and development of intellect and personality of the students who, as professionals, would be confident to face the challenges of the world of work.
- To empower the faculty and staff for overall development of students.

Program: M.Tech. (Artificial Intelligence & Data Science)

Program Educational Objectives

PEO-1	Design, develop and implement intelligent systems to solve complex real-life problems using advanced knowledge of AI, Data Science, and similar technologies
PEO-2	Pursue successful careers in industry, research organizations, or establish startups in AI and Data Science, adapting to evolving technological trends
PEO-3	Demonstrate leadership, teamwork, and project management skills while working in multidisciplinary environments in academia, industry, or entrepreneurship
PEO-4	Exhibit effective communication skills, execute profession with ethical responsibility, considering societal, environmental, and legal implications of AI and data-driven technologies
PEO-5	Conduct research, innovation, and lifelong learning, contributing to advancements in ML, big data analytics, and intelligent decision-making systems

Program Articulation Matrix

PEO	PEO-1	PEO-2	PEO-3	PEO-4	PEO-5
Mission Statements					
To impart effective education at graduate levels in the field of Computer Science and Engineering.	3	2	1	1	2
To conduct Research and Development and offer consultancy services.	2	2	2	-	3
To improve continuously the quality of teaching-learning process.	2	1	1	1	3
To strive steadily for the overall growth and development of intellect and personality of the students who, as professionals, would be confident to face the challenges of the world.	1	2	2	2	1
To empower the faculty and staff for overall development of students.	2	3	2	2	1

v1 - Slightly;

2 - Moderately;

3 - Substantially

Program: M.Tech. (Artificial Intelligence & Data Science)

Program Outcomes

PO-1	Solve complex problems by applying the advanced techniques of AI, and data science.
PO-2	Develop efficient AI-based and data-driven solutions by analyzing the real-world problems
PO-3	Develop novel models/algorithms by conducting independent research, and contribute to advancements in AI and data science.
PO 4	Use state-of-the-art frameworks, platforms, and tools for model development, and deployment through data analysis.
PO-5	Understand data privacy, bias, and fairness related ethical issues and apply responsible AI practices.
PO-6	Work in teams, communicate effectively, and manage multidisciplinary projects efficiently.

Mapping of Program Outcomes (PO) With Programme Educational Objectives (PEO)

PO	PEO-1	PEO-2	PEO-3	PEO-4	PEO-5
1	3	2	1	-	-
2	3	2	1	-	1
3	3	2	-	-	3
4	3	2	1	1	-
5	2	1	3	2	1
6	2	1	2	3	2

CURRICULUM

M.Tech. (Artificial Intelligence & Data Science

Semester - I

S.No.	Code	Course Title	L-T-P	TA	MSE	ESE	Total	Credits
1	CS32111CS	Mathematical foundation for Data Science	3-0-0	20	30	100	150	3
2	CS32112CS	Advanced Data Structures & Algorithms	3-0-0	20	30	100	150	3
3	CS32113CS	Applied Machine and Deep learning	3-0-0	20	30	100	150	3
4	CS3212XCS	Elective-1	3-0-0	20	30	100	150	3
5	CS3212XCS	Elective-2	3-0-0	20	30	100	150	3
6	CS32141CS	Lab with Capstone Project- Advance Data structure with Python Programming	0-0-4	25	25	50	100	2
7	CS32142CS	Lab with Capstone Project- ML& DL lab	0-0-4	25	25	50	100	2
8	CS32161CS	Seminar & Comprehensive	0-0-3	--	--	50	50	1
	Total Credits							20

Tentative List of Elective Subjects may be updated as and when required			
Elective-1		Elective-2	
Code	Course Title	Code	Course Title
CS32121CS	Recommender Systems	CS32125CS	Advanced Deep Learning and Computer Vision
CS32122CS	Quantum Machine Learning	CS32126CS	Image and Video Analytic Fundamentals
CS32123CS	Computational Methods in Optimization	CS32127CS	Graph Neural Networks
CS32124CS	Parallel Computing		

Semester - II

S.No.	Code	Course Title	L-T-P	TA	MSE	ESE	Total	Credits
1	CS32211CS	Deep Reinforcement Learning	3-0-0	20	30	100	150	3
2	CS32212CS	Generative Artificial Intelligence	3-0-0	20	30	100	150	3
3	CS32213CS	Data Engineering and Analytics	3-0-0	20	30	100	150	3
4	CS3222XCS	Elective-3	3-0-0	20	30	100	150	3
5	CS3222XCS	Elective-4	3-0-0	20	30	100	150	3
6	CS32241CS	Lab with Capstone Project-GenAI	0-0-4	25	25	50	100	2
7	CS32242CS	Lab with Capstone Project-DE	0-0-4	25	25	50	100	2
8	CS32261CS	Seminar & Comprehensive	0-0-3	--	--	50	50	1
	Total Credits							20

Tentative List of Elective Subjects may be updated as and when required

Elective-3		Elective-4	
Code	Course Title	Code	Course Title
CS32221CS	Pattern Recognition	CS32225CS	Fair Interpretable Trustworthy Machine Learning
CS32222CS	Federated Machine Learning	CS32226CS	Agentic AI & Context Engineering
CS32223CS	Blockchain Technology	CS32227CS	Fog and Edge Computing
CS32224CS	Software Hardware Co-Design		

Semester - III

[illegible]

Semester - IV

S.No.	Code	Course Title	L-T-P	TA	MSE	ESE	Total	Credits
1	CS32461CS	Seminar	0-0-4	--	--	100	100	2
2	CS32451CS	Preliminary work on Dissertation	0-0-36	100	100	200	400	18
Total Credits								20