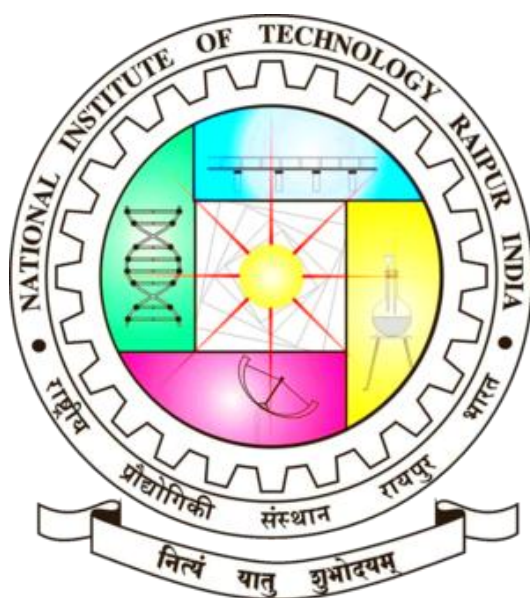


CURRICULUM & SYLLABI
M.Tech. (Computer Science and Engineering)
COMPUTER SCIENCE & ENGINEERING
Effective from AY: 2026-27



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. (Computer Science and Engineering)

Program Educational Objectives

PEO-1	Design, develop, and evaluate advanced software systems and computing solutions to address complex engineering and real-world problems.
PEO-2	Analyze complex computational challenges and develop efficient algorithms and innovative solutions using advanced tools and modern computing techniques.
PEO-3	Collaborate effectively in multidisciplinary environments to identify software requirements, manage projects, and achieve organizational and research goals.
PEO-4	Demonstrate strong communication skills, professional ethics, leadership qualities, and a commitment to societal and environmental responsibilities.
PEO-5	Engage in lifelong learning, research, and professional development to adapt to emerging technologies and contribute to innovation in computer science and engineering.

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	3	2	2	2
To conduct Research and Development and offer consultancy services.	2	3	2	1	3
To improve continuously the quality of teaching-learning process.	2	2	2	2	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.	2	2	3	3	2
To empower the faculty and staff for overall development of students.	1	1	2	2	2

v1 - Slightly;

2 - Moderately;

3 - Substantially

Program: M.Tech. (Computer Science and Engineering)

Program Outcomes

PO-1	Apply critical thinking and research skills to solve complex problems in computer science and engineering.
PO-2	Communicate effectively through technical reports, presentations, and professional interactions.
PO-3	Demonstrate advanced technical and professional skills to address multidisciplinary computing problems.
PO 4	Apply theoretical computer science concepts to design secure, reliable, and efficient software systems.
PO-5	Design efficient solutions and processes with optimal utilization of available resources.
PO-6	Develop robust, scalable, and reliable techniques and tools for advanced computing systems.

MAPPING OF PROGRAM OUTCOMES (PO) WITH PROGRAM EDUCATIONAL OBJECTIVES (PEO)

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

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Semester_I

S.No.	Code	Course Title	L-T-P	TA	MSE	ESE	TOTAL MARKS	Credits
1	CS31111CS	Mathematical foundation for Computer Science	3-0-0	20	30	100	150	3
2	CS31112CS	Advanced Data Structures & Algorithms	3-0-0	20	30	100	150	3
3	CS31113CS	Introduction of AI and Machine Learning	3-0-0	20	30	100	150	3
4	CS3112XCS	Elective-1	3-0-0	20	30	100	150	3
5	CS3112XCS	Elective-2	3-0-0	20	30	100	150	3
6	CS31141CS	Lab with Capstone Project- Advance DS with Python Programming Lab	0-0-4	25	25	50	100	2
7	CS31142CS	Lab with Capstone Project- AI & ML lab	0-0-4	25	25	50	100	2
8	CS31161CS	Seminar & Comprehensive	0-0-3	-	-	50	50	1
Total			15-0-11	150	200	650	1000	20

Tentative List of Elective Subjects may be updated as and when required			
Elective-1		Elective-2	
Code	Course Title	Code	Course Title
CS31121CS	Fog and Edge Computing	CS31125CS	Applied NLP with Large Language Models
CS31122CS	Reinforcement Learning	CS31126CS	Advanced Deep Learning and Computer Vision
CS31123CS	Computational Methods in Optimization	CS31127CS	Advanced Computer Architecture
CS31124CS	Generative Artificial Intelligence		

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Semester_II

S.No.	Code	Course Title	L-T-P	TA	MSE	ESE	TOTAL MARKS	Credits
1	CS31211CS	Data Engineering and Analytics	3-0-0	20	30	100	150	3
2	CS31212CS	Foundation of Modern Cryptography and its Application	3-0-0	20	30	100	150	3
3	CS31213CS	Distributed Systems and Cloud Computing	3-0-0	20	30	100	150	3
4	CS3122XCS	Elective-3	3-0-0	20	30	100	150	3
5	CS3122XCS	Elective-4	3-0-0	20	30	100	150	3
6	CS31241CS	Lab with Capstone Project-DBMS & DEA	0-0-4	25	25	50	100	2
7	CS31242CS	Lab with Capstone Project- Foundation of Modern Cryptography and its Application	0-0-4	25	25	50	100	2
8	CS31261CS	Seminar & Comprehensive	0-0-3	-	-	50	50	1
Total			15-0-11	150	200	650	1000	20

Tentative List of Elective Subjects may be updated as and when required			
Elective-3		Elective-4	
Code	Course Title	Code	Course Title
CS31221CS	Blockchain Technology	CS31224CS	Digital Forensics
CS31222CS	Cyber Physical System Security	CS31225CS	Multi-Agent Reinforcement Learning
CS31223CS	Federated Machine Learning	CS31226CS	Quantum Machine Learning
		CS31227CS	High Performance Computing

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Semester_III

S.No.	Code	Course Title	L-T-P	TA	MSE	ESE	TOTAL MARKS	Credits
1	CS31361CS	Seminar	0-0-4	-	-	100	100	2
2	CS31351CS	Preliminary work on Dissertation	0-0-36	100	100	200	400	18
Total			0-0-40	100	100	300	500	20

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Semester_IV

S.No.	Code	Course Title	L-T-P	TA	MSE	ESE	TOTAL MARKS	Credits
1	CS31461CS	Seminar	0-0-4	-	-	100	100	2
2	CS31451CS	Preliminary work on Dissertation	0-0-36	100	100	200	400	18
Total			0-0-40	100	100	300	500	20