



Masters (M.Tech) Specialization in **Data Science and Engineering**



National Institute of Technology Agartala
Computer Science and Engineering Department

<http://www.nita.ac.in>

Data Science & Engineering

Highlights of the Masters (M.Tech) Specialization in Data Science and Engineering at NIT Agartala

Advanced curriculum
Strong research group support
Placement facilities
Excellent lab facilities



Major aspects of the program

Theoretical foundations: This will include the mathematical background required for the subjects.

Application of Theory: This will include courses where the fundamentals and advanced concepts (subjects) could be implemented.

Thesis/Project Work: Covering the application of the concepts learned or research- oriented work.

Program Objectives

To offer a specialized curriculum for meeting the industry demand in the Data Science domain.

To build strong theoretical foundations required for Data Science.

To develop skills for applying the concepts on practical problems.

Career Opportunities

A student, on completion of this program, will be able to

- undertake industry careers involving innovation and problem-solving and join the industry as a Data Scientist/Data Analyst/Data Engineer.
- pursue higher studies (PhD) to join leading R & D organizations as a Scientist or as a faculty member in leading academic institutions.



Data Science & Engineering

Program Outcomes (POs)

PO1: To develop the ability to apply knowledge of mathematics, engineering sciences for conducting independent research/investigation for solving practical problems.

PO2: To develop the ability to identify, formulate, conduct experiments, interpret data, synthesize information, and analyze engineering problems by writing and presenting an effective technical report/document.

PO3: To develop the ability to demonstrate mastery over the area as per the program's specialization. The knowledge should be at a level higher than the requirements in the appropriate bachelor's program.

PO4: To develop problem-solving ability to design solutions for complex engineering problems in the context of societal and environmental commitments.

PO5: To demonstrate the capability of functioning effectively as a member or team leader in software projects considering multidisciplinary environments, thus solving real-world multifaceted problems.

PO6: To develop design thinking capabilities for innovation and contribute to technological knowledge and intellectual property development.

Need for the program

The past two decades has witnessed the involvement of IT enabled services in every sector. With the proliferation of social media services, the dynamics of the World Wide Web has shifted from data consumption to a data generation environment. The social media services have enabled not only organizations but also individual users as the content providers. The Internet traffic is increasing exponentially and so is the volume of data. Applications such as social media, healthcare, e-commerce, weather forecast, traffic monitoring, etc., are producing massive amounts of data, the so-called "BIG DATA", at an unprecedented scale. This has led to a critical need for skilled professionals, popularly known as Data Scientists, who can mine and interpret the data. Mining this massive data is an exceedingly difficult challenge for scientific, technological, and industrial disciplines. In order to fill the gap between the demand and supply of Data Scientists and Technologists, the Department of CSE at NIT Agartala offers a two years full time Masters Programme in Data Science & Engineering.

Data Science & Engineering

Eligibility

Admission is carried out through the central counselling CCMT. If seats are lying vacant, then students are admitted through a selection process conducted by the institute.

Scholarship

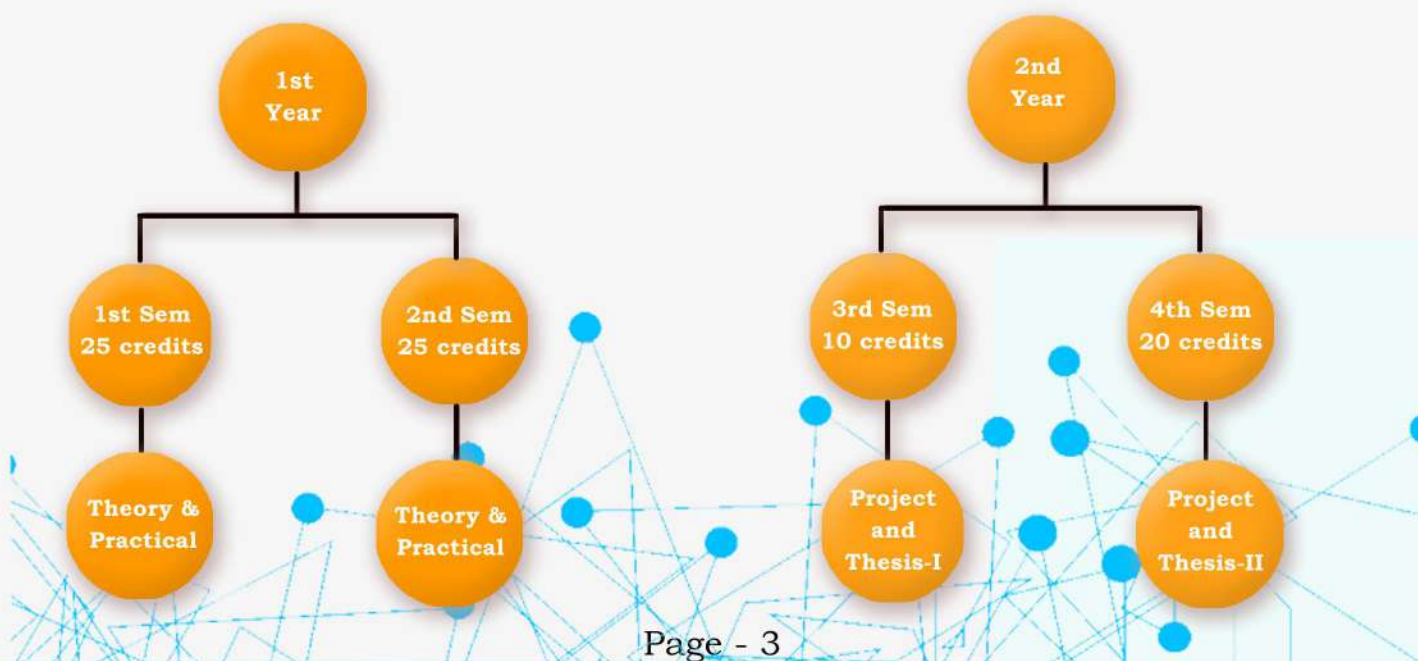
Students admitted through CCMT are eligible to get a monthly scholarship subject to fulfilment of other criteria and financial availability from Ministry of Education, Government of India.

Program duration

Two years (Four Semester) full time.

Program Structure

The program has a total of 80 credits. The credits are distributed into 25 credits each in the 1st and 2nd semester, 10 credits in the 3rd semester, 20 credits in the 4th semester. The first year (1st and 2nd semester), covers theory and practical classes, and the 2nd year (3rd and 4th semester), covers a research Project and thesis. The research can be carried out either in the institute or in an Industrial organization so that at least one research paper could be published by the students. The detailed credit, subject and syllabus of the program are available in the department's website.



Data Science & Engineering

Evaluation System

- Continuous Evaluation system is followed.
- Credit based Cumulative Grade Point Average (CGPA) System along with SGPA (Semester Grade Point Average) system is adopted.
- Theory subjects are evaluated based on Internal Assessment (30 marks), Mid Term Examination(20 marks), and End Term Examination (50 marks). Questions are prepared following the Blooms Taxonomy satisfying the NBA pattern.
- Project and Thesis are being evaluated by an Evaluation Committee where External Expert from renowned institutions/organizations like IITs, NITs are present to evaluate the works being carried out by the scholar under the supervision of a faculty member.

Lab Facilities

The institute has a dedicated Data Analytics Lab for the specialization

Training & Placement Facilities

The institute has a dedicated training and Placement cell named Career Counselling Department (CCD) through which students are provided training, internships and placements.



Data Science & Engineering

Course Structure of M.Tech. in DSE

Semester	Subject	L	T	P	Cr.	Class Hours per week	Marks
1	1. Advanced Data Structures and Algorithms	3	1	0	4	4	100
	2. Data Mining	3	1	0	4	4	100
	3. Mathematical Foundations for Data Science	3	1	0	4	4	100
	4. Elective I *	4	0	0	4	4	100
	5. Elective II*	4	0	0	4	4	100
	6. Laboratory I (Advanced Data Structures and Algorithms)	0	0	2	2	3	100
	7. Laboratory II (Data Science Foundation)	0	0	2	2	3	100
	8. Seminar	0	0	1	1	2	100
	Total	17	3	5	25	28	800
2	1. Machine Learning	3	1	0	4	4	100
	2. Big Data Analytics	3	1	0	4	4	100
	3. Elective III *	4	0	0	4	4	100
	4. Elective IV *	4	0	0	4	4	100
	5. Laboratory- I (Machine Learning Lab)	0	0	2	2	3	100
	6. Laboratory-II (Data Science Implementation)	0	0	2	2	3	100
	7. Project Preliminaries	0	0	3	3	6	100
	8. Comprehensive Viva	0	0	2	2	0	100
	Total	14	2	9	25	28	800

* To be chosen from the list of electives.

Project
and Thesis

Data Science & Engineering

Course Structure of M.Tech. in DSE

Semester	Subject	L	T	P	Cr.	Class Hours per week	Marks
3	Project and Thesis Work- I *Students may go for industrial or inter institute collaboration, based Project work for 6 months to 1 year. The DPPC and concerned local guide may be empowered to recommend such provision. All existing academic rules of institute will prevail. The exact modalities may be recommended by DPPC.	0	0	10	10	FULL	100
	Total	0	0	10	10		100

Semester	Subject	L	T	P	Cr.	Class Hours per week	Marks
4	Project and Thesis Work- II *Students may go for industrial or inter institute collaboration, based Project work for 6 months to 1 year. The DPPC and concerned local guide may be empowered to recommend such provision. All existing academic rules of institute will prevail. The exact modalities may be recommended by DPPC.	0	0	20	20	FULL	300
	Total	0	0	20	20		
Cumulative credit of the course							
Semester-I		17	3	5	25	28	800
Semester - II		14	2	9	25	28	800
Semester - III		0	0	10	10	Full	100
Semester - IV		0	0	20	20	Full	300
	Total	31	5	44	80		2000

Data Science & Engineering

Course Structure of M.Tech. in DSE

S. No.	List of Elective Subjects	L	T	P	Cr.	Class Hours per week	Marks
1	Next Generation Database	4	0	0	4	4	100
2	Stochastic Models and Applications	4	0	0	4	4	100
3	Natural Language Processing	4	0	0	4	4	100
4	Soft Computing	4	0	0	4	4	100
5	Reinforcement Learning	4	0	0	4	4	100
6	Intrusion Detection System	4	0	0	4	4	100
7	Computer Vision	4	0	0	4	4	100
8	Information Retrieval	4	0	0	4	4	100
9	Recommender Systems	4	0	0	4	4	100
10	Deep Learning	4	0	0	4	4	100
11	Data Visualization	4	0	0	4	4	100
12	Data Science in Bioinformatics	4	0	0	4	4	100
13	Data Science for Decision Making	4	0	0	4	4	100
14	Social Network Analysis	4	0	0	4	4	100
15	Time Series Data Analysis	4	0	0	4	4	100

Core Faculty Group

Sl. No.	Name of the faculty member	Designation	Area
1	Dr Diptendu Bhattacharya	Associate Professor	Soft Computing, Time series, Computational Intelligence
2	Dr Swapan Debbarma	Assistant Professor	NLP, High Performance Computing
3	Dr Kunal Chakma	Assistant Professor	Machine Learning, Deep Learning, Data Science, NLP
4	Dr Anupam Jamatia	Assistant Professor	NLP, Social Media Analytics, Machine Learning
5	Dr Dwijen Rudrapal	Assistant Professor	NLP, Information Retrieval
6	Dr Suman Deb	Assistant Professor	Computer Vision, Robotics
7	Dr Ashim Saha	Assistant Professor	DBMS, IOT, Image Processing
8	Dr Nirmalya Kar	Assistant Professor	Cyber Security

Data Science & Engineering

Program Coordinator:

Dr. Kunal Chakma

Assistant Professor

Department of Computer Science and Engineering

Email: kchakma.cse@nita.ac.in

<https://kunalchakma.com>

Program Co-coordinator:

Dr. Anupam Jamatia

Assistant Professor

Department of Computer Science and Engineering

Email: anupamjamatia@nita.ac.in

