Course Structure

For

M.Tech. degree

in

Artificial Intelligence and Data Science

Computer Science and Engineering

Indian Institute of Information Technology Kalyani

Webel IT Park Campus

West Bengal 741235, India

Program Highlights
The curriculum will prepare the candidates to take challenges in the areas of Artificial Intelligence, Deep Learning, Security, Visual Information Processing, Internet of Things, and Blockchain for working professionals in IT Industry.

Program Objectives
- Apply Artificial Intelligence and Data Science concepts in engineering and social applications
- Research oriented course structure focusing industry needs
- Online mode of teaching with introduction of case studies, simulations and virtual labs
- Learners to be introduced to real-world problems
- Special emphasis on scholarly publications (Journal/conference publication)
- Flexibility like course-break (up-to one year)
- Continuous evaluation system and research output based evaluation
- Can be extended to integrated PhD depending on the performance of the candidate

Program Outcomes
At the end of the curriculum, the students will be able to:
- Apply Artificial Intelligence and Data Science concepts in engineering and social applications
- Design products to address real-life problems focusing on machine learning, deep learning, artificial intelligence, IoT, blockchain, security, data analytics, and so on
- Analyze and interpret data/information
- Apply the tools to secure the information systems
- Analyze the security aspects of the information systems
- Develop analytical capability in relation with various socio-economic issues and to address solutions towards them
- Develop the ethical responsibility towards society, building cognitive responses, project management skills.

Program Structure
- A self-paced programme of 62 credits (choice based)
- The credits can be earned over 3 to 4 years.
- Theory coursework: 27 credits.
- Laboratory: 08 credits
- Dissertation: 24 credits
- Comprehensive Viva: 03 credits
- Projects in last two semesters (after the course works are complete), 12 credits each. The students will have the option of taking lesser number of courses in a semester and complete the coursework requirement in 3 to 4 years.
- The projects can be taken only after all the credits of the core courses are earned.

Intake
Thirty (30) per year

Eligibility
Qualifying degree: B.Tech./B.E. degree in CS/IT/ECE, an MCA, or an MSc/MS in CS/IT/ECE.

The candidate should have scored at least 60% aggregate in the degree examination. The candidates from industry, after acquiring the qualifying degree may join the course, subject to the approval of the parent organization.

Age Limit: There is no upper age limit for admission in the programme.

Admission Procedure

Admission will be done as per merit in the entrance test conducted by IIIT Kalyani.

Course Modality

The programme will be conducted via live online classes and virtual labs conducted over the weekends. The schedule will be communicated in advance and be flexible enough so that working professionals can manage smoothly.

Degree to be conferred

- After successful completion of the full credit requirement, student will get M.Tech degree in Artificial Intelligence and Data Science.
- Individual certificates will be issued against each completed course also.

Credit Structure

Description	Credits
Core courses	15
Elective Courses	12
Laboratory	08
Major Project Dissertation	24
Comprehensive Viva Voce	03
Total credits	**62**

Fee Structure and Registration System

For successful completion of the program, a student has to earn 62 credits in total. The credit structure is shown in the table above. The fee structure will have two components:

(a) Registration fee of INR 10,000 per semester to keep the enrolment active.

(b) The course fee: Rs. 5000 per theory credit registration and Rs. 3000 per sessional / project credit registration. For example, in a semester, if a student registers for C1 theory credits and C2 sessional / project credits then the candidate has to pay INR $(5000 \times C1 + 3000 \times C2 + 10000)$ in that semester.

**All the credits must be earned within eight semesters (four years) to get the degree.

Course Structure

Semester: I						
Theoretical Papers						
Sl. No.	Code	Subject	Classes/ Week			Credit
			L	T	P	
1		Mathematical Foundations for Data Science	3	0	0	3
2		Advanced Data Structures and Algorithms	3	0	0	3
Sessional Papers						
1		Advanced Data Structures and Algorithms Lab	0	0	3	2
Total						**8**

L: Lecture, T: Tutorial, P: Practical

Semester: II						
Theoretical Papers						
Sl. No.	Code	Subject	Classes/ Week			Credit
			L	T	P	
1		Artificial Intelligence	3	0	0	3
2		Elective – I	3	0	0	3
Sessional Papers						
1		Artificial Intelligence Lab	0	0	3	2
Total						**8**

Semester: III						
Theoretical Papers						
Sl. No.	Code	Subject	Classes/ Week			Credit
			L	T	P	
1		Machine Learning	3	0	0	3
2		Elective – II	3	0	0	3
Sessional Papers						
1		Machine Learning Lab	0	0	3	2
Total						**8**

Semester: IV						
Theoretical Papers						
Sl. No.	Code	Subject	Classes/ Week			Credit
			L	T	P	
1		Data Mining	3	0	0	3
2		Elective – III	3	0	0	3
Sessional Papers						
1		Data Mining Lab	0	0	3	2
Total						**8**

Semester: V						
Sl. No.	Code	Subject	Classes/ Week			Credit
			L	T	P	
1		Elective - IV	3	0	0	3
2		Major Project Dissertation	0	0	0	12
Total						**15**

Semester: VI						
Sl. No.	Code	Subject	Classes/ Week			Credit
			L	T	P	
1		Major Project Dissertation	0	0	0	12
2		Comprehensive Viva Voce	0	0	0	03
Total						**15**

List of Electives

All electives will have L-T-P loading 3-0-0 and 3 credits.

1. Cryptography and Network Security	12. Internet-of-Things
2. Bioinformatics	13. Blockchain Technology
3. Combinatorial Geometry	14. Wireless Communications
4. Fuzzy Logic and Applications	15. Mobile Computing
5. Graph Algorithms and Information Mining	16. Advanced DBMS
6. Neural Network & Deep Learning	17. Advanced Operating Systems
7. Natural Language Processing	18. Advanced Cryptography
8. Soft Computing	19. Cyber Physical Systems
9. Computer Vision and Image Understanding	20. Information Theory and Coding
10. Information Retrieval	21. Digital and Cyber Forensics
11. Big Data Analytics	22. Post-Quantum Cryptography