



INDIAN INSTITUTE OF TECHNOLOGY PATNA

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Executive M-Tech in Artificial Intelligence

Department of Computer Science & Engineering

Indian Institute of Technology Patna

Overview of Executive M-Tech Program in AI:

From August 2022 semester, CSE department is offering a new MTech program known as Executive M-Tech Program in Artificial Intelligence (AI). This M.Tech. in AI program will offer students with deep knowledge of core and applied Artificial Intelligence, especially Speech, Video and Text Analytics. This program is aiming at imparting the necessary breadth and depth to the working executives in industry. This program is aiming at extending undergraduate computing skills with up-to-date and in-depth expertise in specialized areas of Speech Technologies, Computer Vision and Natural Language Processing etc.

Eligibility Criteria and Admission Process

1. This program is exclusively for professionals working in the industry.
2. The candidate should have a BTech/BE degree in CS/EE/IT/ECE, or an MCA, an MSc/MS/ME/M.Tech. degree in CS/IT.
3. At least 60% marks or 6.5 CGPA in one of the qualifying exams (BTech/BE in CS/EE/IT/ECE, or MCA, or MSc/MS/ME/M.Tech. in CS/IT)
4. By the date of application deadline, the candidate must have a minimum three years of work experience in a relevant industry and be employed in industry at the time of applying. Internship experience, teaching experience, and the experience before completing the earliest qualifying degree (as listed above) are not counted.
5. Exceptional candidates with B.Tech./BE degree or an ME/M.Tech. degree in other disciplines will be considered, provided they have outstanding academic records and strong programming work experience in the industry (which should be clearly demonstrated in the application), and/or strong background in machine learning/data science related areas (which should be clearly demonstrated in the application). The right to shortlist such candidates (with a different academic training background other than those listed in Point 2) will remain with IIT Patna. The objective criteria regarding minimum experience and marks in qualifying exam remain the same as mentioned above.

Credit Structure

Credits are assigned to the courses based on the following general pattern:

- (a) Two credits for each lecture period. Thus, a course with 3 lecture hours in a week will have $3 \times 2 = 6$ credits.
- (b) One credit per hour for each Laboratory or Practical, Seminar or Project/Thesis session. Thus, a laboratory course with 3 practical hours in a week will have $3 \times 1 = 3$ credits
- (c) Each semester will last 14 weeks. Thus, to earn 6 course credits, $3 \times 14 = 42$ lectures contact hours during the whole semester are needed to be attended. Likewise, to earn 3 practical credits, $3 \times 14 = 42$ laboratory contact hours are needed to be attended during the whole semester.



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Course structure for Executive M-Tech Program in AI

Semester I:

Sl. No.	Course Number	Course Title	L	T	P	C
1.	CS561	Artificial Intelligence	3	0	0	6
2.	CS XXX	Scientific Computing using Python	3	0	0	6
3.	CS564	Foundations of Machine Learning	3	0	0	6
4.	CS XXX	Linear Algebra and Optimization techniques	3	0	0	6
5.	CS XXX	Elective-I	3	0	0	6
6.	CS XXX	AI Lab-I	0	0	3	3
7.	HS5XX	HSS Elective	2	0	0	4
TOTAL			17	0	3	37

Semester II:

Sl. No.	Course Number	Course Title	L	T	P	C
1.	CS551	Intro to Deep Learning	3	0	0	6
2.	CS XXX	Computer Vision and Image Processing	3	0	0	6
3.	CS563	Natural Language Processing	3	0	0	6
4.	CS XXX	Elective-II	3	0	0	6
5.	CS/ME/EEXX	Elective-III	3	0	0	6
6.	CS XXX	AI Lab-II	0	0	3	3
7.	HS5XX	HSS Elective	2	0	0	4
TOTAL			17	0	3	37



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Semester III:

Sl. No.	Course Number	Course Title	L	T	P	C
1.	CS6XX	Project Thesis-I	0	0	24	24
TOTAL						24

Semester IV:

Sl. No.	Course Number	Course Title	L	T	P	C
1.	CS6XX	Project Thesis-II	0	0	24	24
TOTAL						24

Total Credits: 122 (1232 hours)

L: Lecture hours per week

T: Tutorial hours per week

P: Practical/Laboratory hours per week

C: Credits

Elective Courses:

1. CS5XX - Introduction to Blockchain and Cryptocurrency
2. CS5XX - Cryptography
3. CS5XX - Introduction to Data science
4. CS5XX - Social Network Analysis
5. CS5XX - Software Engineering
6. CS5XX - Database Management Systems
7. CS5XX - Advances in Algorithms
8. CS5XX - Graph Theory
9. CS5XX - Time Series Analysis
10. CS5XX - Distributed Systems
11. CS5XX - Computer Graphics
12. CS5XX - Big Data Analytics



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Executive M-Tech in Mechatronics

Department of Mechanical Engineering

Indian Institute of Technology Patna

Overview of Executive M-Tech Program in Mechatronics:

Department of Mechanical Engineering offers an Executive M-Tech. program in Mechatronics. Mechatronics is a multi-disciplinary study dealing with the integration of mechanical devices, actuators, sensors, electronics, intelligent controllers and computers. Many new generations of consumer or commercial products can be classified as mechatronic products as they involve mechanical as well as electronic components. The program is designed to provide in-depth knowledge in the fundamentals, modelling, simulation, analysis, and operation of mechatronic systems.

Eligibility Criteria and Admission Process

1. This programme is exclusively for industry professionals working.
2. The candidate should have a B-Tech./BE or equivalent degree in Mechanical / Production /Aerospace/ Electrical/ Electronics & Communication/ Instrumentation Engineering or MSc in Electronics and Instrumentation for Mechatronics.
3. At least 60% marks (or a CGPA of 6.5 on a 10-point scale) in the final qualifying examination.
4. By the date of the application deadline, the candidate must have a minimum of three years of work experience in a relevant industry and be employed in the industry at the time of applying. Internship experience, teaching experience, and the experience before completing the earliest qualifying degree (as listed above) are not counted.
5. Exceptional candidates with a B-Tech./BE degree or a ME/M-Tech. degree in other disciplines will be considered, provided they have outstanding academic records and extensive work experience in the industry (which should be clearly demonstrated in the application), and/or strong background in the specialization chosen/related areas (which should be clearly demonstrated in the application). The right to shortlist such candidates (with a different academic training background other than those listed in Point 2) will remain with IITP. The objective criteria regarding minimum experience and marks in the qualifying exam remain the same as mentioned above.

Credit Structure

Credits are assigned to the courses based on the following general pattern:

- (a) Two credits for each lecture period. Thus, a course with 3 lecture hours in a week will have $3 \times 2 = 6$ credits.
- (b) One credit per hour for each Laboratory or Practical, Seminar or Project/Thesis session. Thus, a laboratory course with 3 practical hours in a week will have $3 \times 1 = 3$ credits
- (c) Each semester will last 14 weeks. Thus, to earn 6 course credits, $3 \times 14 = 42$ lectures contact hours during the whole semester are needed to be attended. Likewise, to earn 3 practical credits, $3 \times 14 = 42$ laboratory contact hours are needed to be attended during the whole semester.



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Course structure for Executive M-Tech Program in Mechatronics

Semester I:

Sl. No.	Course Number	Course Title	L	T	P	C
1.	MH501	Fundamentals of Mechatronics	3	0	0	6
2.	MH503	Advanced Engineering Mathematics	3	0	0	6
3.	ME/CS/EE	Elective-I	3	0	0	6
4.	ME/CS/EE	Elective-II	3	0	0	6
5.	ME/CS/EE	Elective-III	3	0	0	6
6.	MH519	Mechatronics Lab-I	0	0	3	3
7.	HS5XX	Management Elective-I	3	0	0	6
TOTAL			18	0	3	39

Semester II:

Sl. No.	Course Number	Course Title	L	T	P	C
1.	MH502	Sensors and Actuators	3	0	0	6
2.	MH504	Modelling and Simulation of Mechatronic Systems	3	0	0	6
3.	ME/CS/EE	Elective-I	3	0	0	6
4.	ME/CS/EE	Elective-II	3	0	0	6
5.	ME/CS/EE	Elective-III	3	0	0	6
6.	MH520	Mechatronics Lab-II	0	0	3	3
7.	HS5XX	Management Elective-II	3	0	0	6
TOTAL			18	0	3	39



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Semester III:

Sl. No.	Course Number	Course Title	L	T	P	C
1.	MH6XX	Project Thesis-I	0	0	20	20
TOTAL						20

Semester IV:

Sl. No.	Course Number	Course Title	L	T	P	C
1.	MH6XX	Project Thesis-II	0	0	24	24
TOTAL						24

Total Credits: 122 (1204 hours)

L: Lecture hours per week

T: Tutorial hours per week

P: Practical/Laboratory hours per week

C: Credits

Elective Courses

1. ME501: Robotics: Advanced Concepts and Analysis (3-0-0-6)
2. ME512: Mobile Robotics (3-0-0-6)
3. ME533: Finite Element Analysis (3-0-0-6)
4. ME506: Computer numerical controlled machine tools (3-0-0-6)
5. ME504: Vehicle Dynamics and Multi-body Systems (3-0-0-6)
6. ME510: Robot Motion Planning (3-0-0-6)
7. ME5XX: Soft Robots: Design, Modeling and Manufacturing
8. ME5XX: Digital manufacturing and Industry 4.0 (3-0-0-6)1
9. EE525: Digital Image Processing (3-0-0-6)
10. EE528: Deep learning for video surveillance systems (3-0-0-6)
11. EE575: Embedded System Integration (3-0-0-6)
12. CS566: Advanced Machine Learning (3-0-0-6)
13. CS565: Cloud Computing (3-0-0-6)

Management Elective Courses (Offered By HSS Department)

1. Business Ethics (HS552) (3-0-0-6)
2. Organization Behaviour (HS751) (3-0-0-6)
3. Sourcing and Managing Talents (HS752) (3-0-0-6)



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PG Diploma in Human Resource Management

Department of Humanities and Social Sciences

Indian Institute of Technology Patna

Overview of PG Diploma course in Human Resource Management

Department of Humanities and Social Sciences offers a 1-year post-graduate program in Human Resource Management. This program has been designed for working professionals in people management roles. It aims to offer participants a comprehensive understanding of the challenges in managing human resources in the competitive business arena. As the course will be delivered online during weekends, it will provide the participants with the opportunity to upskill themselves without disengaging from their careers.

Eligibility Criteria and Admission Process

1. This program is exclusively for working professionals.
2. The candidates should have a graduate degree in any discipline from a recognized university with at least 60% marks or 6.5 CGPA.
3. By the date of the application deadline, the candidate must have a minimum of three years of full-time professional experience and be employed in the industry at the time of applying. Internship experience, teaching experience, and the experience before completing the earliest qualifying degree (as listed above) are not included as a part of this experience criterion.

Credit Structure

Credits are assigned to the courses based on the following general pattern:

- (a) A course with 3 lecture hours in a week will have 5 credits.
- (b) Each term will last 12 weeks. Thus, to earn 5 course credits, $3 \times 12 = 36$ lectures contact hours during the whole term are needed to be attended.

Course Structure for PG Diploma Program in Human Resource Management

Term 1		L	T	P	C
1	Business Communication	2	1	0	5
2	Individual Behavior in Organizations	3	0	0	5
3	Business Economics	3	0	0	5
4	Leadership and Team Building	3	0	0	5
Total		11	1	0	20



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Term 2					
		L	T	P	C
1	Conflict Management and Negotiation	3	0	0	5
2	Sourcing and Managing Talent	3	0	0	5
3	Business Research Methods	2	1	0	5
4	Behavioral Economics and Finance	3	0	0	5
Total		11	1	0	20

Term 3					
		L	T	P	C
1	HR Analytics	2	1	0	5
2	Industrial Relations and Labor Legislations	3	0	0	5
3	Organization development and Change Management	3	0	0	5
4	Performance and Compensation Management	3	0	0	5
Total		11	1	0	20

Term 4					
1	Project/Dissertation*	0	0	24	24 credits

Total Credits: 84 (720 hours)

- L:** Lecture hours per week
- T:** Tutorial hours per week
- P:** Practical/Laboratory hours per week
- C:** Credits

* Optional, non-credit campus visit for 10 days for mentoring will be included



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Course Pedagogy:

The course will be delivered online by faculty members of IIT Patna during weekends. The pedagogy will comprise lectures taught with the help of case studies, individual and group assignments, presentations, simulations, experiential exercises, self-assessment, and role plays.

Who can attend?

This program is relevant to both HR professionals and line managers with people management responsibilities.

Assessment:

The faculty members teaching their respective courses will choose the method of evaluation most appropriate to the course.

Project:

The project work commences at the beginning of Term IV and will continue up to the end. The participants will essentially need to meet the faculty guide for discussion and reporting of progress. Assessment of the project will be against pre-determined milestones and deliverables such as data collection analysis, draft report presentation, final viva-voce, and final project report.