## Highlights of B.E. Robotics and Artificial Intelligence at MMIT Pune
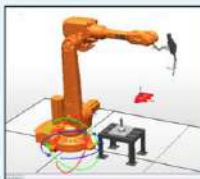
- E-Yantra Robotics lab (A robotics outreach programme by IIT Bombay)
- Robotics Society of India (Student Chapter)
- All India Council for Robotics & Automation
- Representing MMIT in the prestigious National Robotics Contest – ROBOCON
- Organizing various robotics events in Pune regional competitions
- Building mini-projects and B. E. projects in Robotics and Artificial Intelligence
- Presenting research papers at national and international conferences

Participation In ROBOCON National Event
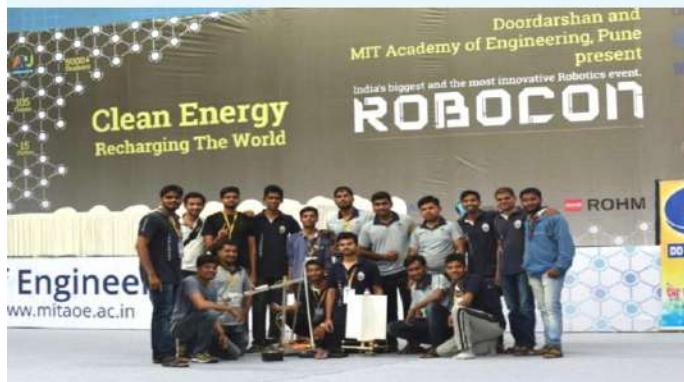
Lab's Information

Robot Simulation Lab

E-Yantra Robotics Lab

Python Programming / AIML/Data Analytics Lab

Data Acquisition and Measurement Lab

Kinematics of Robotics Lab

Digital Manufacturing Lab- 3D Printer

Career Opportunities

After completing a B.E. Robotics & AI programme, graduates can pursue a variety of career paths. Some of the popular career options for engineers are:

- **Research and Development:** The engineers can opt for research and development (R&D) roles in aerospace, automotive and manufacturing industries. They can work on cutting-edge technologies and develop new products that can bring revolutionary changes to the industry.
- **Robotics & AI:** Robotics involves the design, construction and operation of robots, while AI is concerned with creating machines that can simulate human intelligence and learning. AI can also be used to automate decision-making processes, reducing the risk of errors.
- **Automotive Industry:** The automotive industry is a major employer of mechanical engineers. They can also work on developing new technologies such as electric and hybrid engines, advanced safety systems, and autonomous driving systems.
- **Manufacturing:** The engineers can work on designing, developing and implementing manufacturing processes and technologies to enhance the efficiency and quality of the production process.
- **Entrepreneurship:** The engineers can start their ventures. They can use their skills and knowledge to develop new products and technologies to bring revolutionary changes in various industries.

Robotics & AI Related Applications

Robotics Related Areas of Applications	AI Related Areas of Applications
Manufacturing	Robotics
Space Explorations	Navigation
Agriculture	Agriculture
Health Care	Health Care
Under Water Explorations	E-Commerce
Military	Application Software
Customer Services	Marketing
Education	Education
Food Industry	Social media
Security	Human Resources
Automobiles	Automobiles
Entertainment	Gaming

Industrial Opportunities

'येथे बहुतांचे हित'
(Welfare of Masses)

"Techno - Social Excellence"

Marathwada Mitramandal's Institute of Technology (MMIT)
Lohgaon, Pune

Accredited with "A" Grade by NAAC
Affiliated to SPPU, Pune | Approved by AICTE & DTE
Survey No. 35, Vadgaon Shinde Road, Lohegaon, Pune - 411 047.

B.E.
(Robotics and Artificial Intelligence)

INFORMATION BROCHURE

Marathwada Mitramandal, Pune is a Public Charitable Trust established in 1967 by Hon. Late Shankarraoji Chavan, Former Home Minister, Govt. of India as the "Founder President" and followed by Hon. Late Vilasraoji Deshmukh, Former Union Minister, Govt. of India. It is established through the inspiration of socially and educationally charged personalities, with motto "Yethe Bahutanche Hit" (Welfare of Masses). Mass education, co-education and dedication towards overall development of the region are watchwords of the trust. The institute is committed to promote innovative, creative and entrepreneurship ambience, essential to cater our student in learning core and interdisciplinary concepts, & come up with sustainable and harmonious innovations to enhance resolute and prosperous coexistence of mankind.

The Marathwada Mitramandal's Institute of Technology, (MMIT) Lohgaon was established in 2008. The institution is affiliated to Savitribai Phule Pune University (SPPU), Pune and is approved by AICTE, New Delhi, recognized by DTE, Government of Maharashtra. The institute is accredited with NAAC "A" Grade. The institute offers Bachelor of Engineering (B.E.) in 6 Engineering Disciplines: Robotics and Artificial Intelligence, Mechanical Engineering, Mechatronics Engineering, Civil Engineering, Computer Engineering, and Artificial Intelligence and Data Science. Also, offers Master of Engineering in Computer Engineering and Robotics and Automation.

Vision

To offer a leading programme, fostering innovation and research, where intelligent systems enhance human experiences, guided by responsible AI practices and a diverse community of forward-thinking professionals.

Mission

To educate and empower students in the fields of AI and Robotics, equipping them with the skills and knowledge to develop intelligent systems that improve lives and contribute to societal progress.

Overview of the Department

Robotics and Artificial Intelligence (ROAI) is an inter-disciplinary branch of Computer Science, Mechanical Engineering and Electronics Engineering. It introduces students to the domains of design, construction, application and operation of robots.

Robotics and Artificial Intelligence (ROAI) can transform Indian industries towards Industry-4.0 revolution. Manufacturing industry and supply chain organizations need to transform themselves towards digitization. The technological advancements worldwide have made it necessary for Engineers to have knowledge of Artificial Intelligence & Machine Learning (AI&ML) for manufacturing and robotics systems. The degree offers a solid conceptual grounding in intelligent systems alongside the chance to apply knowledge in a practical setting, designing, building and testing robots. The areas of study may include: robot principles and design; software development; Internet of Things (IoT); robot intelligence control; AI and mobile robots; and operational management.

The ROAI programme at MMIT covers:

- Advances in artificial intelligence and sensor technologies that allow robots to cope up with a far greater degree of task-to-task variability.

- The ability to adapt robotic actions in response to changes in their environment that will create opportunities for automation in the areas such as agriculture, industrial automation, healthcare, transportation and defence sectors.
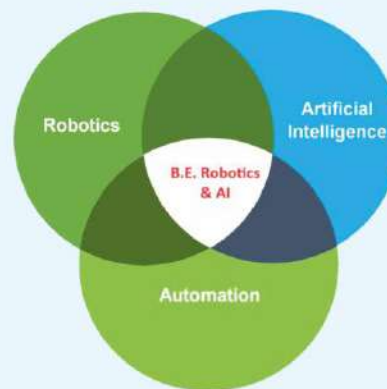
Outline of the Course

The Unique Selling Proposition (USP) of our Robotics and AI programme lies in its interdisciplinary approach, combining cognitive technologies, AI/ML, computer vision, and robotics. This holistic curriculum prepares students to tackle complex challenges by providing them with a comprehensive understanding of the field. Additionally, our strong industry partnerships and opportunities for research collaboration

ensure that students gain real-world exposure and stay at the forefront of technological advancements. The program covers a wide range of topics, including: Robotics: Robot design and manufacturing, robot sensing and control, robot programming, and robot applications Artificial Intelligence: Programming, machine learning, big data analytics, deep learning, and IT and communication systems.

Benefit of the Program

This programme will provide ample opportunities to graduates with portfolio of real-world projects to take into their chosen careers. The Curriculum for programme B.E. Robotics and Artificial Intelligence may include following courses :

Basics of Robotics & AI	Program Elective- I
Data Structure	Control Systems
Engineering Materials and Metallurgy	Mechatronics System Design
Microprocessor and Microcontrollers	Cloud computing
Computer Aided Geometric Modeling Lab	Intellectual Property Rights
CNC Programming Lab	Program Elective- II
Analog & Digital Electronics	Data Analytics
Design of Machine Elements	Cyber Security
Industrial Robotics & Automation	Robot System Design
Kinematics of Robot	Mobile Robots
Smart Manufacturing	Program Elective- III
Python Programming Lab	Image Processing
Artificial Intelligence & Machine Learning	Product Design and
Signals and Systems	Development
Computer Aided Engineering	Flexible Manufacturing Systems
Drives for Robot Systems	Program Elective- IV
Digital Manufacturing Lab	Industrial application of RAI
Robot Simulation Lab	Industry 4.0
Numerical Methods & Programming Languages	Finite Element Analysis
Sensors and Actuators for Robots	Machine Vision
Additive Manufacturing	Program Elective- V
Data Acquisition and Measurements Lab	Smart Sensors
Robotic Language Lab	Robot System Design
Internship/Mini Project	Modelling of Robotic systems
Industry 4.0 and IOT	Augmented Reality and
Artificial Intelligence in Robotics	Virtual Reality
Autonomous Navigation Lab	Program Elective- VI
Arial Robotics Lab	Composite Materials
CAD/CAM	Micro and Nano Manufacturing
Flexible Manufacturing Systems	Robot Safety and Maintenance
Data Analytics Lab	Applications of AI