(047-CMC-11-02) MECHANICAL ENGINEERING (ROBOTICS AND AI)

Significance of the Program

A Bachelor of Technology (B. Tech) program in Mechanical Engineering with a specialization in Robotics and Artificial Intelligence (AI) holds significant importance in the context of the evolving technological landscape. Here are some key aspects of the significance of such a program: Integration of Traditional and Emerging Technologies, versatility in Career Opportunities, Industry 4.0 Readiness, Innovation in Robotic Design, Human-Robot Collaboration, Research and Development Opportunities and preparation for Future Challenges.

B. Tech program in Mechanical Engineering (Robotics and AI) offers a comprehensive education in the rapidly advancing field of robotics and AI.

Career Options:

1. Robotics Engineer
2. Automation Engineer
3. AI/Machine Learning Engineer
4. Control system Engineer
5. Product design Engineer
6. R&D Engineer
7. Entrepreneur/Start-up Founder
8. Quality Assurance Engineer
9. Project Manager

Program objectives:

1. Equip students with the skills to integrate robotics and AI technologies into mechanical systems, fostering an interdisciplinary approach to problem-solving and innovation.
2. Develop students' ability to design mechanical and robotic systems, considering factors such as performance, efficiency, reliability, and safety. Encourage creativity in designing solutions that incorporate AI for enhanced functionality.
3. Enable students to understand and apply automation and control principles to mechanical systems, with a focus on implementing robotics and AI for autonomous and intelligent behaviour.

4. Provide practical, hands-on experience through laboratory work, projects, and internships. This hands-on approach helps students apply theoretical knowledge to real-world problems and gain practical skills in designing, building, and troubleshooting mechanical and robotic systems.

Outcomes of the Program:

1. Exhibit proficiency in the design of mechanical and robotic systems. Graduates should be capable of integrating AI technologies into the design process to enhance system functionality and performance.
2. Possess programming skills necessary for the control and optimization of robotic systems. Graduates should be able to write, test, and debug code in languages commonly used in robotics and AI applications.
3. Showcase the ability to integrate mechanical components, sensors, actuators, and AI algorithms to create cohesive and functional robotic systems. Graduates should understand the interdisciplinary nature of integrating technologies for system optimization.
4. Demonstrate knowledge and application of automation and control principles in mechanical systems. Graduates should be capable of designing and implementing control systems for autonomous and intelligent behaviour.

Major Course Outlines:

1. Kinematics and Dynamics of Robots with Robot Programming and Control
2. Sensors and Actuators in Robotics
3. Artificial Intelligence: Machine Learning, Deep Learning
4. Natural Language Processing and Computer Vision with Reinforcement Learning
5. Robotics Programming (e.g., ROS - Robot Operating System)