

Program Learning Outcomes (PLOs) for the Bachelor's Program in Mechatronics Engineering

Knowledge

- PLO1. Identify and describe fundamental principles in mathematics and natural sciences as they apply to problem-solving in engineering contexts.
- PLO2. Explain fundamental concepts of mechanics, electronics, and computer science in relation to the design and implementation of mechatronic systems.
- PLO3. Illustrate how information technology can be used for simulation, system design, project management, and effective communication.
- PLO4. Knowledge about the effects of engineering applications on health, environment, and safety on both universal and societal scales; knowledge about current problems affecting the field of engineering; awareness of the legal implications of engineering solutions.

Skills

- PLO5. Apply the principles of mechatronics, developed through the engineering sciences, to solve practical problems, system modeling, and design engineering processes and products.
- PLO6. Select and apply computer-based methods associated with the modeling and analysis of engineering problems and the design of engineering systems.
- PLO7. Demonstrate the ability to develop, choose, and utilize modern techniques needed to analyze and solve problems encountered in the applications of mechatronics engineering.
- PLO8. Demonstrate the ability to design and perform experiments, collect and analyze data, and assess results for problems in Mechatronics Engineering.
- PLO9. Apply an integrated or systems approach to engineering design and produce innovative solutions to a wide range of engineering problems using established techniques to test and evaluate design ideas.
- PLO10. Use time and resource management techniques to meet project management milestones.

Competencies

- PLO11. Develop the ability to independently acquire and apply new knowledge and skills in mechatronics engineering, demonstrating a high level of self-directed learning and continuous professional development.
- PLO12. Communicate clearly and effectively using evidence, graphics, and writing skills.
- PLO13. Keep an open mind to lifelong learning and self-development, adopting a lifelong learning philosophy, following state-of-the-art developments in engineering, and improving oneself.

| | Courses | Program Learning Outcomes (PLO) | | | | | | | | | | | | |
|--------------------------------------|--|---------------------------------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|
| | | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 | PLO7 | PLO8 | PLO9 | PLO10 | PLO11 | PLO12 | PLO13 |
| Semester I | Introduction to Physics | 1 | 1 | | | 1 | | | | 1 | | | | |
| | Introduction to Chemistry and Environment | 1 | | | 1 | 1 | | | | | | | | |
| | Mathematics 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | | |
| | Introduction to Mechanics | 1 | 1 | | | 1 | 1 | | | | | | | |
| | Computer Science 1 | 1 | 1 | 1 | | | 1 | | | | | | | |
| | Engineering Graphics and CAD | | 1 | | | 1 | | | | 1 | | | | 1 |
| Semester II | Fundamental of Engineering Mechanics | 1 | 1 | | | 1 | | 1 | | | | 1 | | |
| | Mathematics 2 | 1 | 1 | | | 1 | 1 | | | 1 | | | | |
| | Material Science and Engineering | 1 | 1 | | | 1 | | 1 | 1 | | | | | |
| | Computer Science 2 | | 1 | | | 1 | 1 | 1 | | | | | 1 | |
| | Fundamentals of Electronic and Electrical Engineering | 1 | 1 | | | 1 | 1 | 1 | 1 | | | | | |
| | Laboratory 1* (Electronic and Electrical Engineering Lab) | | | | | 1 | | 1 | 1 | | | | | |
| Economics and Engineering Management | | | | 1 | | | | | | 1 | | | 1 | |
| Semester III | Introduction to Mechatronics | | 1 | 1 | | 1 | | 1 | 1 | | | 1 | | |
| | Instrumentation and Measurement | | 1 | | | | 1 | 1 | 1 | 1 | | 1 | | |
| | Laboratory 2 | | | | | 1 | | 1 | 1 | | | | | |
| | Digital Circuits and Signals | | 1 | | | 1 | 1 | 1 | 1 | | | 1 | | |
| | Fluid and Thermodynamics | | 1 | | | 1 | 1 | 1 | 1 | | | | | |
| | Information Technology | | | | | 1 | 1 | 1 | | | | 1 | 1 | |
| | Law, Ethics and Engineering | | | | 1 | | | | | | 1 | 1 | 1 | |
| Semester IV | Production Automation | | | 1 | | 1 | 1 | 1 | 1 | | | 1 | | |
| | Modelling and Simulation | | | 1 | | 1 | 1 | 1 | 1 | | | 1 | | |
| | Control Engineering | | | | | 1 | 1 | 1 | 1 | 1 | | 1 | | |
| | Laboratory 3 | | | 1 | 1 | 1 | | 1 | 1 | | | | | |
| | Software Systems Engineering | | | 1 | | 1 | 1 | 1 | | | 1 | 1 | | |
| | CAD/CAM | | | | | 1 | 1 | 1 | 1 | 1 | | 1 | | |
| Semester V | Artificial Intelligence | | | | | 1 | 1 | 1 | | 1 | | | | 1 |
| | Embedded Systems | | 1 | | | 1 | 1 | 1 | | | | | | 1 |
| | Mechatronic Systems (Design and Implementation) | | | | 1 | 1 | 1 | | 1 | | | 1 | | 1 |
| | Robotics | | | | | 1 | | 1 | 1 | 1 | | 1 | | 1 |
| | Image Processing | | | 1 | | 1 | | 1 | | 1 | | | | 1 |
| | Industrial and Organizational Psychology | | | | | | | | | | 1 | 1 | 1 | 1 |
| | Project Management Engineering | | | | | | | | 1 | | 1 | 1 | | 1 |
| | Smart Manufacturing and Industrial Internet of Things (IIoT) | | | 1 | | | | 1 | | | 1 | | | 1 |
| | Scientific and Technical Research | | | | 1 | 1 | | | | | | 1 | | 1 |
| | Internship | | 1 | | | 1 | | | | | | | | 1 |
| | Thesis | | 1 | 1 | 1 | 1 | | 1 | 1 | | | 1 | 1 | 1 |