MTRE 4300: Machine Learning for Robot Perception

4 Credit Hours

Prerequisite: MTRE 2610 and MATH 2202 and MATH 3260 and Engineering Standing

This course introduces the most important topics in the areas of machine learning and computer vision and their specific applications in robotics and mechatronics. The machine learning and computer vision algorithms are extensively verified with simulated and physical robots in the mechatronics lab. Students are trained for developing physical or virtual intelligent robot systems through integrating robot control and machine learning algorithms. Significant programming effort and lab hardware experience are expected.

MTRE 4400: Directed Research - Mechatronics

1-6 Credit Hours

Prerequisite: Set by instructor of each individual section

Directed research course for Mechatronics.

MTRE 4410: Mechatronics, Industrial, and IoT Communication

3 Credit Hours

Prerequisite: Engineering Standing Requirements

This course presents the fundamental communication principles vital for industrial, robotic, and IoT applications, encompassing serial/parallel communication, industrial protocols, internet frameworks, and IoT/WSN protocols, along with cybersecurity and cyber-physical systems security. Incorporating the influence of AI and machine learning on communication and their utility as a tool, the curriculum extends to real-world implementations, reinforced by reading research papers and completing assignments. Moreover, the course equips students with skills in rapid prototyping and foundational market practices, guiding students in delivering compelling presentations and planning for prototype product development.

MTRE 4490: Special Topics - Mechatronics

1-6 Credit Hours

Special Topics course for Mechatronics