
Computer Integrated Manufacturing (CIM) Course Description

Computer Integrated Manufacturing (CIM) is the study of manufacturing planning, integration, and implementation of automation.

The course explores manufacturing history, individual processes, systems, and careers. In addition to technical concepts, the course incorporates finance, ethics, and engineering design. This reflects an integrated approach that leading manufacturers have adopted to improve safety, quality, and efficiency.

Utilizing the activity-project-problem-based (APPB) teaching and learning pedagogy, students will analyze, design, and build manufacturing systems. While implementing these designs, students will continually hone their interpersonal skills, creative abilities, and understanding of the design process. Students apply knowledge gained throughout the course in a final open-ended problem to build a factory system.

Computer Integrated Manufacturing is a high school level course that is appropriate for 10th, 11th, or 12th grade students interested in manufacturing and automation. It is recommended that students are concurrently enrolled in grade level mathematics and science courses and have successfully completed the Introduction to Engineering Design (IED) course.

CIM is one of the specialization courses in the Project Lead The Way high school engineering program. The course applies and concurrently develops secondary-level knowledge and skills in mathematics, science, and technology.

The course of study includes:

- Principles of Manufacturing
 - History of manufacturing
 - Manufacturing as an enterprise
 - System process flow
 - Automated control
 - Cost of manufacturing
- Manufacturing Processes
 - Design considerations for manufacturability
 - Property analysis
 - Ethics and safety
 - Creating a prototype
 - Manufacturing processes and machines
 - CNC mill programming and usage

- Elements of Automation
 - Robotic simulation and physical testing
 - Power systems
 - Pneumatic system design and construction
- Integration of Manufacturing Elements
 - Computer Integrated Manufacturing system types
 - Manufacturing and automation career research
 - Manufacturing system design and construction