

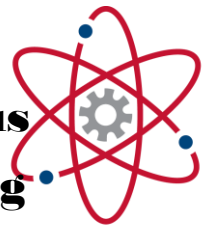


# Muscle Shoals Course Syllabus

Tereza Burden  
[tburden@mcs.k12.al.us](mailto:tburden@mcs.k12.al.us)

256-389-2660 ext.1680

**Course Fee \$30.00**



PROJECT LEAD THE WAY

**PLTW**

Project Lead the Way (PLTW) is the nation's leading provider of science, technology, engineering, and math (STEM) programs. Computer Integrated Manufacturing (CIM) is a PLTW Engineering Specialization Courses offered at Muscle Shoals Career Academy. The course deepens the skills and knowledge of an engineering student within the context of efficiently creating the products all around us. Students build upon their Computer Aided Design (CAD) experience through the use of Computer Aided Manufacturing (CAM) software. CAM transforms a digital design into a program that a Computer Numerical Controlled (CNC) mill uses to transform a block of raw material into a product designed by a student. Students learn and apply concepts related to integrating robotic systems such as Automated Guided Vehicles (AGV) and robotic arms into manufacturing systems.

## Computer Integrated Manufacturing (CIM)

Manufactured items are part of everyday life, yet most students have not been introduced to the high-tech, innovative nature of modern manufacturing. This course illuminates the opportunities related to understanding manufacturing. At the same time, it teaches students about manufacturing processes, product design, robotics, and automation. Students can earn a virtual manufacturing badge recognized by the National Manufacturing Badge system.

### Unit 1 Computer Modeling

- Section 1.1 Fundamentals
- Section 1.2 Object Construction
- Section 1.3 Parts Modeling
- Section 1.4 Creation of Working Drawings
- Section 1.5 Surface Modeling
- Section 1.6 Rapid Prototyping

### Unit 3 Robotics

- Section 3.1 Introduction to Robotics
- Section 3.2 Robotics and Automated Systems
- Section 3.3 Robot Characteristics
- Section 3.4 Robot Controllers
- Section 3.5 Programming the Robot
- Section 3.6 End Effectors
- Section 3.7 Robot Applications

### Unit 2 CNC Machining

- Section 2.1 History of Programmable Machining
- Section 2.2 CNC Characteristics
- Section 2.3 CNC Programming
- Section 2.4 CNC Operation
- Section 2.5 CAM Software

### Unit 4 Computer Integrated Manufacturing

- Section 4.1 Rationale for CIM Manufacturing
- Section 4.2 Types of CIM Systems
- Section 4.3 Components of CIM Systems
- Section 4.4 CIM System Applications

## Student Expectations

- Bring pencil, highlighter, three-ring binder, loose-leaf paper, graph paper, planner, and a positive attitude.
- Arrive on time, ready to work, actively participate, and complete all required assignments.
- Become competent in the full scope of the course curriculum and assemble a professional portfolio.

## Discipline Procedures

All rules, regulations, guidelines, and policies of the Muscle Shoals Board of Education, Muscle Shoals High School Handbook, and Muscle Shoals Career Academy Handbook will be followed.

**Consequences:** 1. Verbal Warning 2. Student Conference 3. Parent Conference 4. Office Referral  
*Certain violations will result in an immediate office referral*

**BE RESPECTFUL**

**BE RESOURCEFUL**

**BE RESPONSIBLE**