

Introduction to Engineering & Manufacturing

RCAS Policies/Procedures

Students will be required to follow all RCAS policies and procedures. To view the RCAS High School Student Handbook, click [handbook](#).

Course Description

In this course, students will learn the difference between engineering and manufacturing while being exposed to mechanical, civil, electrical, chemical, and industrial engineering fields. This course will include problem-based projects where students integrate both engineering and manufacturing concepts.

Grading

Points will be awarded for assignments, quizzes, and the final exam/project. These points will be collected cumulatively through the academic year for an assigned final grade.

Textbook

N/A

Reading

N/A

Optional Reading

N/A

Instructional Resources

CADD: Revit & Fusion 360

Industry Guest Speakers & Learning Tours/Events

Fabricating Tools/Equipment, Construction Supplies and Safety Equipment

Simulators

Maker Space

Essential Questions

IE 1: What specific fields within engineering make up the industry, and how can students examine these fields?

IE 2: How can students investigate and learn about various engineering systems?

IE 3: Can student apply the engineering process to a product?

IE 4: Can students demonstrate effective communication?

IE 5: Will students be able to examine testing procedures used on materials in engineering?

IM 1: How can students pursue career exploration and development?

IM 2: Will students be able to plan, manage and perform the processing of materials into intermediate or final products and understand related professional and technical support activities such as production planning and control, maintenance, and manufacturing/process engineering?

IM 3: In what ways can students implement manufacturing technology safety practices?

IM 4: How can students apply ethical and sustainable practices in the workplace as they relate to today's society?

IM 5: Can students utilize the appropriate tools and equipment utilized in the manufacturing industry?

IM 6: Can students differentiate among a variety of manufacturing industries?

IM 7: Can students design and create a product using the engineering design process?

Essential Learning Intentions

IE: 1: Identify the types of engineers.

IE: 1: Describe the engineering team.

IE 2: Identify various types of engineering systems.

IE 2: Apply engineering systems to solve problems.

IE 3: Design a product.

IE 3: Construct a three-dimensional (3-D) model.

IE 3: Build and test a prototype.

IE 3: Develop a system to produce a final product.

IE 4: Demonstrate effective oral communication.

IE 4: Demonstrate effective written communication.

IE 5: Analyze materials based on their properties.

IE 5: Analyze material testing procedures.

IM 1: Recognize the various career pathways/occupations that are available in manufacturing process/industry/business.

IM 2: Develop a start-up/basic business plan for manufacturing operations. (Process improvement)- Collaborative process with Business courses.

IM 2: Explain trends (automation/robotics) and issues in the manufacturing industry.

IM 2:

IM 3: Maintain general safety in accordance with government regulations, health standards, and company and/or school policy.

IM 3: Evaluate ergonomic factors associated with the manufacturing industry.

IM 4: Understand what sustainability is and what life cycle analysis means.

IM 5: Use basic tools and equipment common to the manufacturing processes.

IM6: Research and understand basic concepts of the manufacturing career pathways.

IM7: Differentiate products/components in relationship to size, proportion, and tolerances.

IM7: Develop a prototype of a product.

IM7: Test and evaluate a product Quality Control.

IM7: Redesign product for final production. – Process Improvement.

