



Course Outcome Summary

Required Program Core Course

MDTC 236 Rapid Prototyping

Course Information

Division	ASET
Contact Hours	90
Theory	30
Lab Hours	60
Total Credits	4

Prerequisites MDTC 161, MDTC 228

Course Description

In this course, students will learn about the evolution of digital fabrication with a full overview of the design industry and related technologies. Each hands-on, project-based learning (PBL) exercise will allow students to design and fabricate 3D objects using computer-aided design (CAD) software and 3D printers. They will experience the design process and become familiar with the advantages and limitations of each 3D printing technology in terms of precision, resolution, and material capabilities. Students will analyze real industry cases, and apply 3D printing technology appropriately while gaining hands-on experience with leading 3D printing technologies employed in design today.

This course is a required core course for students pursuing an AAS in Mechanical Design Technology

Program Outcomes Addressed by this Course:

Upon successful completion of this course, students should be able to meet the program outcomes listed below:

- A. Effectively communicate technical ideas and problem solving decisions with others.
- B. Demonstrate knowledge, techniques, skills, and use of the appropriate tool in mechanical design applications.
- C. Apply math, science, and engineering technology principles to solve problems in mechanical design.
- D. Use creativity in the design of mechanical components and systems.
- E. Recognize problems in mechanical design applications and develop appropriate solutions.
- F. Work productively as an individual and as a team member of a problem-solving team in an engineering environment.
- G. Recognize the need to stay current in the mechanical design career field.
- H. Demonstrate professional and ethical behavior.

Course Outcomes

In order to evidence success in this course, the students will be able to:

1. **Demonstrate knowledge of key historical factors that have shaped manufacturing over the centuries.**
Applies to Program Outcome
 - B. Demonstrate knowledge, techniques, skills, and use of the appropriate tool in mechanical design applications.
 - G. Recognize the need to stay current in the mechanical design career field.
2. **Explain current and emerging 3D printing applications in a variety of industries.**
Applies to Program Outcome
 - B. Demonstrate knowledge, techniques, skills, and use of the appropriate tool in mechanical design applications.
 - G. Recognize the need to stay current in the mechanical design career field.
 - H. Demonstrate professional and ethical behavior.



3. Describe the advantages and limitations of each 3D printing technology.

Applies to Program Outcome

B. Demonstrate knowledge, techniques, skills, and use of the appropriate tool in mechanical design applications.

G. Recognize the need to stay current in the mechanical design career field.

H. Demonstrate professional and ethical behavior.

4. Evaluate real-life scenarios and recommend the appropriate use of 3D printing technology.

Applies to Program Outcome

A. Effectively communicate technical ideas and problem solving decisions with others.

B. Demonstrate knowledge, techniques, skills, and use of the appropriate tool in mechanical design applications.

E. Recognize problems in mechanical design applications and develop appropriate solutions.

F. Work productively as an individual and as a team member of a problem-solving team in an engineering environment.

G. Recognize the need to stay current in the mechanical design career field.

H. Demonstrate professional and ethical behavior.

5. Identify opportunities to apply 3D printing technology for time and cost savings.

Applies to Program Outcome

A. Effectively communicate technical ideas and problem solving decisions with others.

B. Demonstrate knowledge, techniques, skills, and use of the appropriate tool in mechanical design applications.

E. Recognize problems in mechanical design applications and develop appropriate solutions.

G. Recognize the need to stay current in the mechanical design career field.

6. Discuss the economic implications of 3D printing including its impact on startup businesses and supply chains.

Applies to Program Outcome

A. Effectively communicate technical ideas and problem solving decisions with others.

B. Demonstrate knowledge, techniques, skills, and use of the appropriate tool in mechanical design applications.

G. Recognize the need to stay current in the mechanical design career field.

H. Demonstrate professional and ethical behavior.

7. Design and print objects containing moving parts.

Applies to Program Outcome

A. Effectively communicate technical ideas and problem solving decisions with others.

B. Demonstrate knowledge, techniques, skills, and use of the appropriate tool in mechanical design applications.

C. Apply math, science, and engineering technology principles to solve problems in mechanical design.

D. Use creativity in the design of mechanical components and systems.

E. Recognize problems in mechanical design applications and develop appropriate solutions.

F. Work productively as an individual and as a team member of a problem solving team in an engineering environment.