Salt Lake Community College
EDMT Department

EDDT2460: PRODUCT DESIGN & DEVELOPMENT USING CAD/CAM
SAMPLE SYLLABUS

Instructor:
Office:
Phone:
Consultation Hours: TBD
E-Mail: Please use canvas

COURSE DESCRIPTION: *Uses CAD to design and layout advanced production drawings. Uses CAM to create industry level CNC files for production. Uses industry standard reference materials, i.e., Machinery's or Engineers Handbook, ANSI and/or ASME Specifications, GD & T. Course supports the design, drafting & fabrication for a student's capstone project.*

COURSE LEARNING OUTCOMES: In order to full-fill the goals of the College-wide Learning Outcomes, the following course learning outcomes have been established for this course. Upon completion of this course a student should be able to demonstrate a general understanding of the following essential learning outcomes:

- Create industry standard professional drawings.
- Create industry standard professional CNC programs.
- Understand the roles a Mechanical and Manufacturing Engineers play in an Engineering or Manufacturing organization.
- Perform cost analysis that determines the manufacturability of products.
- Develop the ability to search for and interpret industry standard specifications, ie. ANSI, ASME ASTM
- Test and validate designs using CAE simulation and actual functional testing.
- Engage in in-class discussions with regards to design team goals.

Grading: All grades will be given based on the following distribution:

92 – 100%	A	72 – 77.9%	C
90 – 91.9%	A-	70 – 71.9%	C-
88 – 89.9%	B+	68 – 69.9%	D+
82 – 87.9%	B	62 – 67.9%	D
80 – 81.9%	B-	60 – 61.9%	D-
78 – 79.9%	C+	< 59%	E

Grades distribution:

Individual & Group Projects	70%
ePortfolio	30%

Projects and ePortfolio will be based on the Mars Rover Project being utilized by Engineering Science Mars Rover Competition iterations or revisions and/or a Plastic Injection Molding iteration. Projects could be group or individual depending on class size and parts needing fabrication.

The basic structure for the Mars Rover projects are as follows:

Module 1 – Engineering Design Review for Manufacturability & Redesign

Assignment M1.0 – Recommendations of design changes required.
Assignment M1.1 – Cost estimate of time required to make model changes
Assignment M1.2 – Actual redesign of parts or products.
Assignment M1.3 – shipset requirement – Actual number of parts needed
Assignment M1.4 – Portfolio assessment - Redesign effort, actual time vs estimated time.

Module 2 – Recurring and non-recurring cost estimations, Operation Steps

Assignment M2.0 – Non-recurring cost estimates: Tooling, Fixtures, Operations
Assignment M2.1 – Recurring cost estimates – Machining cut time
Assignment M2.2 – Selection and Purchasing of Tooling and raw material
Assignment M2.3 – Updating non-recurring costs after tooling selection
Assignment M2.4 – CNC Programming of parts or products
Assignment M2.5 – Updating of recurring costs based actual CNC programs
Assignment M2.6 – Portfolio assessment - actual time CNC cut vs estimated time.

Module 3 – CNC Program: Fixture Design, Tape Proofing

        Assignment M3.0 – Tooling and Fixture List
        Assignment M3.1 – Fixture Design if required
        Assignment M3.2 – Fixture fabrication if required
        Assignment M3.3 – Instructor approval of CNC program simulation
        Assignment M3.4 – Tape proofing of actual machine cutting
        Assignment M3.5 – Part measurements & Functionality checks
        Assignment M3.6 – Portfolio assessment – Review of tape proofing activity. What changes to program are needed? Improvement ideas?

Module 4 – CNC Program and iteration #2

        Assignment M4.0 – CNC reprogramming as needed
        Assignment M4.1 – CNC machining iteration #2
        Assignment M4.2 – Part measurements & Functionality checks
        Assignment M4.3 – Portfolio assessment – Review of measurements and functionality checks. Recommended for production or not?

Module 5 – Production Readiness – Manufacturable Drawings, Production Setup Documents

        Assignment M5.0 – Manufacturing ready Drawings with tolerances
        Assignment M5.1 – Production ready CNC setup book, includes tooling setup lists, fixture/part placement with UCS, CNC machining step story.
        Assignment M5.2 – Production run of all parts required for shipset needs
        Assignment M5.3 – Portfolio assessment – Reflection on the entire CAD/CAM development process

Module 6 – ePortfolio review with instructor – Job interview readiness of ePortfolio

Note: Intent of student ePortfolio is demonstrate the CAD/CAM skills gained thru the class that can be shown to potential future employers during a job interview.

If Mars Rover projects are not available a Plastic Injection Mold and Injection Molding project will be utilized. It will follow the basic same structure above.