Manufacturing Engineering Technology Minor

Demonstrate Effective Professional Communication Skills

Goal Description:

Students will develop effective communication skills through written reports, oral presentations, and graphical documents

Providing Department: Manufacturing Engineering Technology Minor

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Demonstrate Effective Professional Communication Skills Learning Objective Description:

This course (ETDD 4388) provides an in-depth review of parametric design and drafting using the SolidWorks software package. Fundamental concepts, techniques, and tools for developing engineering technical drawings with parametric design incorporated will be discussed. By the conclusion of this course, students should be proficient in the following:

- •Perform basic technical drawing-related tasks such as projection and dimensioning.
- •Apply parametric design concepts in developing technical drawings.
- •Understand advanced topics such as tolerance and surface finish.
- •Familiar with standard components such as thread and fasteners.

Student Learning Outcomes:

- **SO-1.2:**Students will demonstrate knowledge of science within industrial applications.
- **SO-2.1:**Students will demonstrate understanding of technical fundamentals.
- SO-2.3: Students will demonstrate an understanding of technical management.
- SO-3.1: Students will be able to utilize graphics design and modeling software.
- **SO-4.2:**Students will demonstrate the ability to prepare electronic presentations.
- **SO-4.3:**Students will demonstrate the ability to give verbal presentations.
- SO-5.1:Students will demonstrate understanding of team roles and processes.
- **SO-5.2:**Students will demonstrate the ability to participate in team situations and group projects.

RELATED ITEM LEVEL 2

Demonstrate Effective Professional Communication Skills

Indicator Description:

- ETDD4388 3D Parametric Design is a required course for students enrolled in the Manufacturing Engineering Technology minor. This course addresses the development of parametric technical models and engineering drawings
- Students are expected to achieve a 70 or higher on a scale of 100 and standard in which $90\% \le A$, $80\% \le B < 90\%$, $70\% \le C < 80\%$, $60\% \le D < 70\%$, F < 60%
- The overall grade for the ETDD4388 3D Parametric Design course is broken down as follows:

Assign	iments	Score
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Total		102
Bonus		2
Final Exam	1	20
Midterm	2 (Equal Weight, 15 + 15)	30
Project	1 (Group Assignment)	12
Quiz	4 (Lowest will be Dropped)	6
Homework	9 (Lowest will be Dropped)	14
Classwork	Dropped)	18

Criterion Description:

Assignments:

There will be three types of assignments for this class:

1.In-class Assignment/Tutorials:

In-class assignments will be structured around the topics covered during each class session. Unless explicitly stated otherwise by the instructor, these assignments must be completed within the designated class meeting hours.

2. Homework Assignment:

Homework assignments will be centered on the subjects discussed throughout the week's lessons. These assignments will be uploaded to Blackboard at the beginning of each week and must be submitted at the start of the following week's class.

3.Quiz:

Quizzes will consist of open-book multiple-choice questions focused on the topics explored during the week's coursework. Students will have the flexibility to take these quizzes at their own pace, as they will be made available on the Blackboard platform and will be available throughout the week. Quizzes will be assigned at the beginning of each week (typically on Mondays) and are due by the end of the week (Friday, 11:59 PM).

Group/Individual Project:

Students will participate in a collaborative/Individual design project, forming groups of 5 to 6 individuals. Each group will submit a project proposal, subject to approval by the instructor. Additionally, the instructor may assign specific group/Individual projects. The presentation (if applies) time for each group will be 10 minutes, followed by a 3-minute question and answer session.

Midterm and Final Exam:

The course will feature two midterm exams and one final exam, all of which are mandatory and must be completed in person. The midterm exams will cover the material taught during the respective periods, and the Final exam will be comprehensive. This will serve as an essential evaluation component for gauging students' grasp of the subject matter.

Findings Description:

ETDD 4388 3D Parametric Design was offered as a hybrid course (50% online & 50% Face-to-Face) during Spring 2024 with 29 students enrolled in it. This course introduces students to the SolidWorks Computer-Aided Design (CAD) tool for the development of 3D models, assembly models, and analysis for effective communication of technical details. The assigned workload and assignments are;

	Assignments	Score
Classwork	8 (Lowest will be Dropped)	18
Homework	9 (Lowest will be Dropped)	14
Quiz	4 (Lowest will be Dropped)	6
Project	1 (Group Assignment)	12
Midterm	2 (Equal Weight, 15 + 15)	30
Final Exam	1	20
Bonus		2
Total		102

The final letter grade distribution is shown below with the table showing the grade distribution of all assignments and exams.

A: 14 students (86.21%)

B: 1 students (3.45%)

C: 1 student (3.45%)

D: 1 students (3.45%)

F: 1 student (3.45%)

RELATED ITEM LEVEL 3

Action - Professional Communication Skills Action Description:

Computer-aided design (CAD) skills are essential for a manufacturing engineer. Based on feedback from students, the course will be offered in the Summer and Fall of 2024 in hybrid form, and further revision of the instructional materials, particularly additional teaching materials and lectures will be added to support student learning outcomes.

Demonstrate Knowledge and Skills

Goal Description:

Students will develop theoretical knowledge and practical skills relevant to manufacturing engineering technology, including engineering graphics, machining technology, manufacturing materials and processes in addition to materials testing

Providing Department: Manufacturing Engineering Technology Minor

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Demonstrate Knowledge and Skills Learning Objective Description:

This course (ETEC 3367 Engineering Materials Tech) introduces engineering materials, such as metals, plastics, and ceramics, used in various industries. The mechanical, thermal, optical, electrical, and magnetic properties of these materials will be discussed. The physical and chemical structure of these materials will also be presented. Students will be able to

- apply fundamental concepts and parameters used to describe the physical properties of various engineering materials to solve practical problems
- apply knowledge of the structure-properties relationship of various engineering materials to explain physical phenomena
- apply knowledge of physical laws and principles that governs the behaviors of materials with application to select engineering materials for various applications
- conduct standard experimental tests to measure and evaluate properties of engineering materials

RELATED ITEM LEVEL 2

Demonstrate Knowledge and Skills

Indicator Description:

- ETEC 3367 Engineering Materials Technology is required for students enrolled in the Manufacturing Engineering Technology minor program. This course addresses key concepts and skills relevant to fundamental properties, behaviors, and applications of various engineering materials
- Students are expected to achieve a 70 or higher on a scale of 100 and standard in which <60 = fail, $60 \sim 69 =$ meet minimum expectations, $70 \sim 79 =$ satisfied, $80 \sim 89 =$ good, >=90 excellent. It is expected that 80% of the students evaluated will score 70 or higher.
- The overall grade for the ETEC 3367 Engineering Materials Technology is broken down as 60% – Chapter assignments, lab activities, and quizzes, 30% - midterm and final exams, and 10% term project.

Criterion Description:

Homework Assignments and Quizzes

An assignment and popup quiz associated with each learning module published on the Blackboard learning management system (LMS) is given to students to assess students' learning and their ability to apply the knowledge to solve practical problems.

Midterm and Final Exams

A midterm and a final exam are given to students at the mid and end of the semester correspondingly. The exams are not accumulative.

Lab Activities

Students perform various lab activities such as performing standard material tests to help with understanding the fundamental concepts and measuring material properties by analyzing data obtained during these lab activities.

Term Project

Students are required to complete a term project to discuss the development of an engineering material or techniques used for processing, fabrication, or manufacturing of the engineering material they are interested in, and then propose possible future research to further develop the material.

Findings Description:

ETEC 3367 is offered as a face-to-face course in the Fall and Spring semesters. The course addresses the fundamental properties of engineering materials and their applications in various industries. Assignments, Lab demos & data analysis, a term project, and two exams were given as the assessment tool to evaluate students' performance, and the following grade distributions were observed.

Fall 2022:
A: 10 students (43.5%)
B: 10 students (43.5%)
C: 3 students (13.0%)
Spring 2023:
A: 11 students (45.8%)
B: 9 students (37.5%)
C: 4 students (16.7%)
Spring 2024:
A: 19 students (38.8%)

B: 18 students (36.7%)

C: 7 students (14.3%)

D: 3 students (6.1%)

F: 2 students (4.1%)

RELATED ITEM LEVEL 3

Action - Knowledge and Skills Action Description:

We will continue the development of the material testing lab to include equipment for the characterization of material microstructure and thermal properties measurement.

New Update to Previous Cycle's Plan for Continuous Improvement Item

Previous Cycle's Plan For Continuous Improvement (Do Not Modify):

Closing Summary

Since this is a new minor, we will continue to review and revise the curriculum and contents of course materials based on feedback from the industrial advisory board (IAB) and students. We will also advertise and recruit more students to minor in the program.

Update of Progress to the Previous Cycle's PCI:

A new ETDD 2366 Machining Technology II focusing on Computer Numerical Control (CNC) machining was developed and was offered in Spring 2024 (ETDD 1366 Machining Technology I was offered in Fall 2023). Two new courses were developed and added to the curriculum: ETEC 3344 Computer Integrated Manufacturing and ETEC 3382Manufacturing Processes II.

New Plan for Continuous Improvement Item

Closing Summary:

Since this is a new minor, we will continue to review and revise the curriculum and contents of course materials based on feedback from the industrial advisory board (IAB) and students. We will also advertise and recruit more students to minor in the program.