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 (ETDD4388 3D Parametric Design) provides an in-depth review of parametric design and drafting using SolidWorks software package. Fundamental concepts, techniques, and tools for developing engineering technical drawings with parametric design incorporated will be discussed. By the end of this course, students will be able to:

- perform basic technical drawing related tasks such as projection and dimensioning
- apply parametric design concepts in developing technical drawing
- develop assembly model and conduct basic analysis such as motion studies
- understand and apply advanced topics and techniques such as sheet metal and stress analysis
- use standard components such as thread and fasteners in modeling and designing processes

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% ≤ A, 80% ≤ B < 90%, 70% ≤ C < 80%, 60% ≤ D < 70%, F < 60%
- The overall grade for the ETDD4388 3D Parametric Design course is broken down as follows: Assignments and in-class lab activities 70%, midterm and final exams 30%

Criterion Description:

Homework Assignments

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

In-class Activities

Students perform various in-class activities related to the materials covered during the lectures

Midterm and Final Exams

A midterm and a final exam are given to students at the mid and end of the semester correspondingly.

Findings Description:

ETDD 4388 3D Parametric Design was offered as a hybrid course (50% online & 50% Face-to-Face) during Spring 2023 with 19 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. Eight required and two optional bonus assignments, 11 lab assignments, and two exams addressing students' comprehension of the knowledge and skills to apply the knowledge to develop practical 3D models were given together with two exams to assess students' performance.

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

A: 14 students (73.7%)

B: 3 students (15.7%)

C: 1 student (5.3%)

D: 0 students

F: 1 student (5.3%)

This assessment shows that the students were performing well using the practical problems for their hands-on exercises.

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 Spring 2024 in hybrid form, and further revision of the instructional materials, particularly the pre-recorded instruction videos, will be refined to have shorter focused topic videos.

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 ~69 = meet minimum expectations, 70~79 = satisfied, 80~89 = 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 50% – Chapter assignments, lab activities, and quizzes, 30% - midterm and final exams, 20% 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 2022 and Spring 2023 semesters, with 23 and 24 students enrolled, respectively. 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%)

All students successfully passed the course with a minimum of a 'C' letter grade.

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 our practice to continuously solicit feedback from our industrial advisory board (IAB) to improve instructional materials and the curriculum further.

Update of Progress to the Previous Cycle's PCI:

A new ETDD2366 Machining Technology II focusing on Computer Numerical Control (CNC) machining was created and scheduled to be offered in Spring 2024 (ETDD 1366 Machining Technology I is offered in Fall 2023).

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.