Mechanical Engineering Technology BS

Demonstrate Effective Professional Communication Skills

Goal Description:

Students will develop effective professional communication skills through course activities such as written reports, team projects, oral presentations, and graphical documents.

Providing Department: Mechanical Engineering Technology BS

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Demonstrate Effective Professional Communication Skills

Learning Objective Description:

Students will develop theoretical knowledge and practical skills relevant to mechanical engineering technology, including stress and strain, deformation, and experimental tests for structural elements such as beams. Students will be able to:

- Analysis structural members subjected to tension, compression, torsion, bending and combined stresses using the fundamental concepts of stress, strain, and elastic behavior of materials
- Analysis of stresses, strains, deflection, and deformation in bodies under the action of loads
- Understanding bending and shearing stresses in beams, stress and shear flow formulas, combined stresses and Mohr's circle, torsion on a circular shaft
- Perform lab experiments that relate to stresses and strain in different structures

RELATED ITEM LEVEL 2

Demonstrate Effective Professional Communication Skills

Indicator Description:

- ETEC 4376 is required for students enrolled in the Mechanical Engineering Technology program. This course addresses the strength of materials subjected to various mechanical loads with applications to the analysis of structural elements such as beams
- 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 ETEC 4376 Strength of Materials course is broken down as follows: Exam 1 and Exam 2 are 15% each, Final Exam is 20%, Homework assignments are 20%, and Laboratory is 30%

Criterion Description:

Homework assignments

The more in-depth assignments are given to students to practice more in different topics and to learn working on their own.

Midterm Exam

Students are assigned exam problems related to the first part of the course material.

Final exam

Students are assigned exam problems that conclude all the course material taught in class.

Lab experiments

Students perform different experiments to understand the concepts taught in class and they submit a lab report after each experiment.

Findings Description:

ETEC 4376 Strength of Materials is a senior-level course, and it was offered in Fall 2021. Since the Mechanical Engineering Technology BS is a new program (started in Fall 2020), only two transferred students enrolled in this course. Therefore, the results obtained in this academic year are not significant. We will continue collecting data and expect more students will enroll in this course as they progress into junior/senior levels.

RELATED ITEM LEVEL 3

Action - Communication Skills

Action Description:

The faculty will continue to collect data to assess students' performance in the ETEC 4376 Strength of Materials course, and thus evaluate their communication skills

Demonstrate Knowledge and Skills

Goal Description:

Students will develop theoretical knowledge and practical skills relevant to mechanical engineering technology, such as mechanical design, analysis, prototyping, and testing

Providing Department: Mechanical Engineering Technology BS

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Demonstrate Knowledge and Skills

Learning Objective Description:

Students will develop theoretical knowledge and practical skills relevant to mechanical engineering technology, including free body diagram, force and moment definitions, analysis of forces on a rigid body, and a couple due to moment of a force. Students receive both lecture-based training and hands-on experience designing and constructing a model bridge from scratch by applying their knowledge on the abovementioned items. Students will be able to

- examine qualitative and quantitative treatments of forces and moments
- design trusses, construct free-body diagrams, and perform equilibrium analysis for coplanar systems.
- apply force analysis extended to beams, brackets, springs, and other commonly seen structural elements in the industry.
- work collaboratively in a team to develop, test, and optimize mechanical systems such as a truss bridge

RELATED ITEM LEVEL 2

Demonstrate Knowledge and Skills

Indicator Description:

- ETEC 3375 Statics is required for students enrolled in the Mechanical Engineering Technology program. This course addresses key concepts and skills relevant to force system analysis with application to static force analysis for mechanical systems such as a bridge
- 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 3375 Statics course is broken down as below.
  28 % – Chapter Tests, 28 % – HomeWorks, 14 % – Final exam, 30 % - Lab activities, 10% - extra credits
- The chapter tests, homework are evaluated through Pearson Mastering in Engineering tool. The final exam and class assignments (extra credits) are evaluated through in-person handwritten exams. Lab activities are evaluated every week through attendance, participation, and progress

Criterion Description:

Reading Assignments

These assignments are scheduled through the Pearson Mastering in Engineering tool integrated with Blackboard. A chapter or specific section will be assigned to students for their reading and help them prep for lectures, homework, and quizzes. Please note that this section doesn't carry any grades but is required for the completion of this course and grade.

Chapter Tutorials

Chapter Tutorials are followed by the reading assignments. These are interactive tutorials that will help you understand the concepts of a chapter through practice problems. Students can learn at their pace and can-do multiple retakes. There will be a slight penalty for every retake, but the best score will be retained for grading. These tutorials take an average of 3-4 hours per week to complete outside the class time.

Chapter Exams

These chapter exams are intended to test your knowledge of individual chapters. Mostly, these exams are multiple-choice questions and will be completed in 30-60 minutes.

Final Exam

The final exam will be comprehensive and based on the end chapter problems of chapters 2-4. It will consist of 9 questions from which the student has to answer any 4. There are no multiple retakes for this exam.

Lab activities

Project: Design and fabrication of a bridge with the predefined span and load requirement (Teamwork)
More detailed instructions about these projects will be available on the Blackboard. All lab activities are planned in Pirkle 100 and hence during Wednesdays, students and the instructor meet at Innovation Lab (Pirkle 100).

Class notes

The instructor will lecture in the class and demonstrate the solving procedure of problems. Students are highly encouraged to make the notes and must show them to the instructor during office hours. The instructor will verify your engagement in the course and will provide feedback.

Class Assignments

Occasionally, the instructor will give class assignments that are counted towards the 10% extra credit. This is to encourage class participation and there will be no retakes and due date extensions for any type of absences.

Findings Description:

The course provided students with the opportunity to apply their 3D design skills and force estimation technique to two real prototyping projects. The course had 23 students and their performance on various indicators is evaluated and given below.

Chapter tests

grade A - 3
grade B - 7
grade C - 7
grade D - 3
grade F - 3

Class assignments

grade A - 1
grade B - 3
grade C - 3
grade D - 2
grade F - 14

Final Exam

grade A - 3
grade B - 7
grade C - 4
grade D - 4
grade F - 5

Homework

grade A - 3
grade B - 10
grade C - 8
grade D - 0
grade F - 2

Lab activities

grade A - 23
grade B - 0
grade C - 0

grade D - 0
grade F - 0

This assessment shows that the students were performing well for hands-on activities in comparison with the theoretical assessments like class assignments and exams.

RELATED ITEM LEVEL 3

Action - Knowledge and Skills
Action Description:
Based on the assessment of ETEC 3375, more emphasis will and should be given on hands on activities. To account this, the future course structure will be more emphasized on hands on activities.

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

Previous Cycle's Plan For Continuous Improvement (Do Not Modify):
This is a new plan for the 2021-2022 assessment cycle. No previous PCI available.

Update of Progress to the Previous Cycle's PCI:
This new degree program is being assessed for the first time for the 2021-2022 assessment cycle. No previous PCI is available.

New Plan for Continuous Improvement Item

Closing Summary:
The faculty teaching courses required by this curriculum will continue to assess the learning objectives of development and demonstration of professional communication skills and technical knowledge to ensure that all Mechanical Engineering Technology students are ready to pursue a professional career in related industries. The faculty will proactively work and support Mechanical Engineering Technology students to meet or exceed the 85% above average rating (B or higher) targeted performance criterion in the Statics and Strength of Materials courses.