Engineering Design Technology BS

Develop Knowledge And Skills

Goal Description:

Students will develop theoretical knowledge, practical skills with 3D modeling tools, and hands-on practical skills relevant to the Engineering Design Technology, including becoming proficient in using design software packages, developing critical think skills, generating additive or subtractive manufacturing prototypes, and writing technical documents.

Providing Department: Engineering Design Technology BS

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Development Of Students Knowledge And Skill

Learning Objective Description:

Students will demonstrate competency in applying product design and development tools such as Creo Parametric, AutoCAD, Solidworks (CAD) software and 3D printer to design and prototype products.

Attached Files

EDT Assessment-Plan-Summary_Learning Objective Description.pdf

RELATED ITEM LEVEL 2

ETDD 4339 Computer-Aided Drafting Productivity

Indicator Description:

All students enrolled in the program are required to complete ETDD 4339 and successfully demonstrate effective use of resources and acceptable designing skills. Each semester, seven randomly selected assignments from five randomly selected students enrolled in the course will be reviewed by faculty members with expertise in the field. Faculty members will score the assignments using a scale of 1 - 5 with 3 "meets expectations," 4 "exceeds expectations," and 5 "far exceeds expectations."

Criterion Description:

There is a general consensus among faculty members that at least 70% of the students enrolled in ETDD 4339 will perform at an acceptable level with a score of 3.5 (meets standards) or higher.

Assignments:

There are two types of assignments: In-class Labwork Assignments (Classwork CW) and Homework Assignments (HW). CW assignments are given based on the techniques discussed in the class. Unless otherwise specified by the instructor, in-class lab assignments must be completed in the class meeting hours.

Final Grading: Final grades will be determined by assigning the following weighting to each area:

Attendance and Observed Performance: 10%
Homework Assignments: 20%
In-class (Classwork) Assignments: 10%
Group Project: 10%
Mid Term Exam (15%)/Quiz (10%): 25%
Final Exam: 25%

Grading Scale

A (90-100)
B (80-89)
C (70-79)
D (60-69)
E (<60)

Part Grading	Total

Sketch				
	Weak Dimensions	25%		100%
	Broken & Overlapping lines	25%		
3D Model				
	3D Tools	50%		

Drawing Grading				Total
Views				
	Orthogonal	12.50%	50%	100%
	Projected	12.50%		
	Sections, Aux, Detail	25%		
Dimensions				
	Dimensions	25%	50%	
	Datums, Axis	25%		

Assembly Grading				Total
Assembly				
	Constraints	12.50%	50%	100%
	Orientation	12.50%		
	Sections	25%		
Assembly Drawing				
	Views	25%	50%	
	BOM	25%		

Findings Description:

ETDD 4339 – Advanced CAD was offered in Spring and Fall of 2021 and Spring 2022. Out of 17 students in the spring 2021 semester 16 received D or better scores, completing all the required assignments in the class. One student received failing score due to missing the second half of the semester despite her excellent progress in class. The lowest term score was 34.88 and the highest was 100 as shown on table ETDD 1

Table ETDD 1. Spring 2021 Term score breakdown

ATT	Q	MT	GP	Final	Term Scor	Adjusted	
10	9.731818	14.2	10	22.5	90.73299	96.75699	A
10	6.990909	9.95	8	18.25	75.88667	81.91067	B
9	7.840909	11.45	10	21.75	81.66488	87.68888	B
10	8.75	13.55	10	21.25	88.86857	94.89257	A
9	9.868182	13.4	5	23	87.30838	93.33238	A
3	3.75	0	0	11.25	27.47749	60	D
10	5.195455	5.7	5	25	71.56602	77.59002	C
10	10	14	7.5	11.25	79.85121	100	A
10	9.181818	11.7	8	25	89.64506	95.66906	A
9	9.681818	14.6	7.5	25	93.97628	100.0003	A
8	8.286364	12.15	7.5	25	82.98754	89.01154	B
9	9.25	12	10	25	91.41416	97.43816	A
10	8.072727	13.6	7.5	25	90.59114	100	A
7	5.5	12.2	5	18.25	61.97597	67.99997	D
10	7.681818	11.5	10	19.75	85.65696	91.68096	A
10	9.745455	12.2	10	20	87.3	93.324	A
5	5	0	8	0	28.8658	34.8898	F

For the Fall 2021 semester out of 20 registered students, three received failing scores (one never attended the course, and other two were overwhelmed with other classes per their explanation). Table ETDD 2 is a breakdown of term scores for Fall 2021

Table ETDD 2. Fall 2021 score breakdown

10%	10%	20%	10%	15%	10%	25%	100%	
ATT	CW AVG	HW AVG	Group Project	Mid Term	Quiz Test	Final Exam	Total Grade	Grade
10	9.9	15.0691	10	15	10	0	80.57	B
2.22222	2.22222	1.81818	0	0	3.7	0	9.96	F
0	1.11111	0	0	0	0	0	1.11	F
1.11111	1.11111	1.80364	10	0	0	0	100.00	A
1.11111	0.31111	0	0	0	0	0	1.42	F
10	10.1593	16.1455	10	9.9	10	24.5	95.70	A
10	9.86296	15.8945	10	15	9.5	23.75	94.01	A
7.77778	9.54815	13.4	10	15	0	0	110.73	A
8.88889	8.28889	18.3418	10	15	5	0	100.52	A
10	10.0519	10.2618	10	14.4	8.5	0	106.21	A
2.22222	2.77778	4.36364	0	15	4	0	28.36	F
10	9.54815	18.0727	10	9.9	4.5	0	100.02	A
7.77778	5.92963	4.54545	0	7.5	5	24.5	60.25	D
10	9.77407	15.3527	0	15	3.5	24.5	78.13	C
10	10.1259	20.1091	10	10.5	9.7	25	100.44	A
10	10.1667	9.43636	10	0	0	0	90.60	A
3.33333	2.37407	1.38182	0	0	0	0	7.09	F
8.88889	8.97778	15.8727	10	0	9.5	0	103.24	A
2.22222	2.15926	3.63636	0	0	0	0	8.02	F
10	10.2148	19.4545	10	12	9.7	0	104.37	A

In the spring 2022 semester, there were 19 registered students, two of whom were repeating from Fall 2021 and passed the course with the highest score. 17 out of 19 students received C or better scores, while the two received the failing scores (one of them repeated from last semester and never attended the course and the other one was overwhelmed with other classes). Table ETDD 3 shows the breakdown of term scores:

Table ETDD 3. Detailed term grade scores for ETDD 4339 Spring 2022 semester

CW	HW	ATT	Q	MT	GP	Final		Term Grade [	
1.70833	2.22222	10	5	0	0	0		18.9306	F
2.48808	4.78556	10	3.5	9.6	0	25		100	A
0.825	1.88889	10	0	0	0	0		12.7139	F
8.86375	18.6733	10	9.4	11.85	9.491	25		100	A
8.92383	18.8133	10	9.9	14.25	9.491	25		100	A
6.02433	7.66689	10	6	7.7	10	23.7083		71.0996	C
9.00842	19.6373	10	9.95	15	10	25		100	A
5.68792	9.74467	10	5.2	7.95	0	25		100	A
1.89675	0.48133	10	0	1.5	0	0		13.8781	F
9.37717	18.1098	10	8.6	12.75	9.491	24.0208		92.3488	A
9.5335	18.7409	10	9	14.7	9.491	9.29167		80.7571	B
5.9255	13.0578	10	9.9	12.24	0	25		100	A
7.221	9.914	10	5	11.595	0	25		100	A
8.47958	13.4444	10	9.9	12.9	0	25		100	A
7.1305	11.9078	10	10	14.799	10	25		100	A
8.00967	10.1373	10	10	14.7	0	25		100	A
4.85825	5.76289	10	4.6	14.4	10	25		100	A
3.58325	6.948	10	4.7	11.8995	10	25		100	A
7.43692	16.6989	10	10	10.9995	0	25		100	A
5.10708	8.16533	10	5	4.9995	0	25		100	A

RELATED ITEM LEVEL 3

ETDD 4339 Computer-Aided Drafting Productivity

Action Description:

The findings revealed that the students are doing great in this class submitting their required assignments and completing the term group projects as well as their presentations. The instructor see that some of the students do not come to class or get overwhelmed with other courses. The instructor will continue to send reminder emails for the assignments and will also continue uploading recorded lecture notes on the Blackboard.

Develop Professional Skills

Goal Description:

Students completing the BS in Engineering Design will demonstrate skills necessary to compete in the professional marketplace through an internship as well as develop practical hands-on prototypes throughout the courses.

Providing Department: Engineering Design Technology BS

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Demonstrate Professional Skills

Learning Objective Description:

This is a computer applications course for design and drafting and introduces students to the techniques used to produce technical models/drawings. Students will learn drafting practices and how to apply them using computer-aided software. Prior knowledge of drafting software and/or prior experience of working with computers is advantageous, but not required/expected. Students will produce technical drawings using various computer design and drafting practices. Concepts of 2D drawings will be covered along with an introduction to three-dimensional parametric modeling. The intent is to develop fundamental knowledge and skills that are conceptually applicable to any computer-aided design (CAD) system.

RELATED ITEM LEVEL 2

ETEC 4391 Internship Evaluation

Indicator Description:

All students enrolled in the program must complete ETEC 4391 in their third or final year of enrollment. ETEC 4391 addresses key concepts and skills, as well as practical demonstrations of competency relevant to the field of each program in the Department of Engineering Technology. Each semester interns will be evaluated by their internship supervisor and by their faculty supervisor on a faculty-developed rating scale.

All students enrolled in the program must complete ETEC 4391 in their junior or senior year of enrollment, and the students need to meet the below student eligibility to register ETEC4391.

1. Minimum semester hours - 32 hrs. Including 15 within the academic major/minor. Some internships may specify courses / content to have been completed.
2. Must be a student in good academic standing at SHSU.
3. Minimum grade of “C” or higher in ENG 1301 and 1302 or equivalent.
4. Transfer students become eligible upon the successful completion of one full-time semester if all other eligibility requirements are fulfilled and apply according to instructions on announcements.
5. Special information regarding Industrial Technology Trades and Industry Certification Program internships (ETEC 4391) - Due to the unique structure of this program, the above listed eligibility requirements do not apply. See the Trades and Industry Certification Program coordinator regarding specific requirements for this program.

The students in ETEC 4391 in Summer 2019 were evaluated by the following detail rubric:

COURSE EVALUATION – GRADING: 100 POINT SCALE

Weekly Reports [10 weekly reports]	10 Points

Summary of Syllabus	5 Points
Resume	5 Points
LinkedIn	5 Points
EMAIL Communication Skills	5 Points
ONLINE Video Review and Summary	10 Points
FINAL SUMMARY PAPER	20 Points
FINAL SUMMARY PRESENTATION	20 Points
Supervisor's Evaluation	15 Points
Supervisor's working hour confirmation letter	5 Points
TOTAL	100 Points

FINAL LETTER GRADE

A = +90 Points

B = 80 – 89 Points

C = 70 – 79 Points

D = 60 – 69 Points

F = under 60%

Criterion Description:

It is expected that at least 85% of the students enrolled in ETEC 4391 will achieve above average standard (4 or higher) of performance on the supervisor rating scale. In general, if the students in ETEC 4391 miss to submit any assignments, the assignments not submitted will impact their final grades by two letter grades.

All assignments should be submitted the specific due dates as below.

Assignments	Due Dates
10 Weekly Reports	By Midnight, Every Following Monday i.e.: The 1st Weekly Report → By Midnight, Jun. 3.
Summary of Syllabus	By Midnight on Jun. 3, 2019
Resume	By Midnight on Jun. 3, 2019
LinkedIn	By Midnight on Jun. 10, 2019
Online Video Review and Summary (1 Video)	By Midnight on Jul. 1, 2019
EMAIL Communication Skills	No due date. (Based on the communication between a student and the instructor)
Final Summary Paper	By Midnight on Jul. 29, 2019
Final Summary Presentation	By Midnight on Jul. 29, 2019
Supervisor's Evaluation	By Midnight on Jul. 29, 2019
Supervisor's working hour confirmation letter	By Midnight on Jul. 29, 2019

Findings Description:

There were 51 Engineering Technology students enrolled in ETEC4391-01 and/or 02 in Summer 2021. The number of students in ETEC4391-1 and/or 2 in Summer 2021 was gently increased compared to the previous year even if we are still under COVID-19. Most students successfully completed this course. The summary of our findings in relation to the learning objectives is shown in the below table.

Summarized Students' Course Achievements in ETEC 4391	
Directly supported learning objectives and student outcomes:	-Students completing the BS in Engineering Technology will demonstrate skills necessary to compete in the professional marketplace through an internship. 1. Work in an Industrial Environment. 2. Work in either a Field Management, a Construction Management, a Superintendent Management, Project Management, Safety Management or combinations of responsibilities. 3. Exhibit characteristics associated with successful employment in industry.
	-Students will establish a professionalism to be ready to start their successful careers in each professional field through an internship. 4. Develop the required reports and maintain progressive reviews that identify the progress being made on the project. 5. Supervise workers in the various trades that are under their responsibilities. 6. Write change orders on specification sheets. 7. Prepare project documents and resources to support the activities for a project.
	-Students will improve their written, oral, and graphical communication skills with stakeholders in each professional field to maintain professional working relationships. 8. Communicate with subcontractors and maintain professional working relationships 9. Write and maintain punch list and other required documentation.

Student's internship supervisors submitted their supervisor's evaluations with their evaluation rating scale and observations to a course instructor, and the evaluation rating was determined by immediate student's internship supervisor using 5 rating scale from A to F and it was based on the performance of internship student at their jobsite during their internship program. 94.1% of internship students received 'A' from their supervisors and 3.9% of internship students received 'B'. Only one internship student, 2.0%, received 'C' in Summer 2021. Therefore, 98% of

internship students achieved higher rating, A or B, and the percent was higher than the target percentile of ETEC4391-1 and/or 2 in summer 2021. In addition, 98% was slightly higher than the percentile of internship students who received A or B from their supervisors in summer 2020.

Most of students completed the course in Summer 2021 and they successfully received above average final letter grade at the end of semester. The summary of the distribution of final letter grade is as follows: 90.2% of students in ETEC4391-01 and/or 02 students achieved above the average final letter grade, and the percentile is higher than the target of criterion, at least 85% of the students enrolled in ETEC 4391 will achieve above average standard ('B' or higher). 3.9% of students achieved 'C' and 5.9% of students achieved 'D'. Overall, the percentile of internship students who received above average standard was improved in Summer 2021. The below table indicates the distribution of final letter grade of ETEC4391-01 and/or 02 in summer 2021.

Final Grade of ETEC4391-01 and/or 02 in Summer 2020	Percentile (%)
A	84.3%
B	5.9%
C	3.9%
D	5.9%

RELATED ITEM LEVEL 3

ETEC 4391 Internship Evaluation

Action Description:

Continue to utilize internships and other opportunities such as service projects to develop professional industrial skills

Update to Previous Cycle's Plan for Continuous Improvement Item

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

Closing Summary

- With the new lecturer hired for the program, the program faculty has discussed to offer ETDD 1366 Machining Technology I in the spring 2022 as a pilot. This course will support the program and Industrial Advisory Board's recommendation to introduce manual CNC and lathe control education to the students. We discussed to continue to offer the course in the Fall of 2022 and develop a more advanced machining technology course for the spring semester to continue the progression in the manufacturing education.
- Additionally, the program faculty has discussed to offer ETDD 2366 Machining Technology II in the Spring of 2023 semester. This course will teach G-Code programming as well as automated CNC manufacturing within the course.
- The engineering design technology faculty will be meeting bimonthly to review course schedules, assessment, and recruitment strategies for the program. This discussion will explore various assessment methods to improve the currently employed procedures. We will start with the development of an assessment tool for the Machining Technology I.
- Additionally, the program faculty will revise current ETDD 1361 course for consistency. There are 5 sections of the course, which is required by other disciplines, including construction, design, and mechanical engineering technology, as well as some agriculture departmental courses. We will be proposing to conduct a brief survey at the beginning of each semester to identify most of the students represented by a program to adjust the course content to meet those students' needs. For instance, if the 80% of the students are from construction, then the instructor would focus more on the architectural cad rather than the part manufacturing. We will also explore the possibility of dedicating some of the sections specifically for construction, design and mechanical. However, students' schedules will also be considered so they can take this course at the most convenient times.

Update of Progress to the Previous Cycle's PCI:

The faculty in the Department of Engineering Technology will continue to assess the learning objectives of development and demonstration of professional skills to ensure that all Engineering Technology students will be ready to successfully start their careers in a professional industrial environment. We will continuously academically and practically support our Engineering Technology students to meet or exceed our target percentile, 85% above average rating (B or higher) of performance on the supervisor's evaluation and final letter grade in the course of Internship.

The new lecturer has been certifying students to OSHA standards and the faculty will incorporate new NCCER certification techniques in classes. The program faculty has updated the ETDD 1361 course syllabus, and the instructors have been following the same course materials.

The machining technology I course was proposed, however, the newly hired lecturer was assigned to a different course and a newly hired tenure track assistant professor taught the machining technology course successfully.

The faculty has successfully proposed to offer machining technology II in the fall 2022 semester and the newly hired assistant professor will be teaching the course in the fall of 2022.

The program faculty has been meeting bi weekly to discuss the current progress of actions and taking necessary revisions. The faculty will continue to meet in the future as we see the benefit.

New Plan for Continuous Improvement Item

Closing Summary:

The faculty in the program will continue to address the observations regarding the needs to add a dedicated course to the existing curriculum addressing construction law and recruitment of additional full-time faculty with the increasing students majoring in this program. A newly hired lecturer for ETEC that will teach ETDD 1361 will meet with the program faculty and will be invited to biweekly meetings to observe and monitor ETDD 1361 consistency.