## **Construction Management BS**

## **Demonstrate Construction Management Knowledge and Skills**

## **Goal Description:**

Students will demonstrate knowledge and skills relevant to Construction Management.

#### Providing Department: Construction Management BS

RELATED ITEMS/ELEMENTS

#### **RELATED ITEM LEVEL 1**

## **Development Of Students' Knowledge And Skill**

#### Learning Objective Description:

Students will be able to demonstrate competency in key areas of Construction Management by successfully displaying skills in an Estimation Course. The Estimation Course serves as a capstone requirement with required skills in construction math, material pricing, bid tabulation, and project scheduling.

#### **RELATED ITEM LEVEL 2**

## ETCM 4368 Cost Estimating - Knowledge and Skills

#### **Indicator Description:**

All students enrolled in the program must complete an estimation class, ETEC 4369, The course addresses key concepts and skills relevant to project cost estimation relative to the field of Construction Management. Students are expected to achieve a 2 or higher on a scale of 0-4, with 0=incompetent, 1=marginal competency, 2=proficient, 3=accomplished, 4=mastered. We expect 80% of the students evaluated will score a 2 or higher. There is consensus among the ETEC faculty that at least 80% of the students will score 2 or higher on the assessment rubric.

#### **Criterion Description:**

An evaluation was made based on the Assessment Rubric for each of the selected students exam work and their ranking is shown below.

Rubric objectives					
Α	в	С	D	Е	F
m	m	а	а	m	m
m	m	а	m	i	i
m	m	а	а	m	m
m	g	р	i	i	i
m	m	а	m	i	i

	Weighted Rubric Objectives						
	0.1	0.3	0.2	0.1	0.2	0.1	
3.425	5	5	1	1	5	5	
2.6	0	0	5	1	5	5	
3.425	5	5	1	1	5	5	
0.5	0	0	0	0	0	5	
2.6	0	0	5	1	5	5	

		Rub	oric Co	unts				
		Α	В	С	D	Е	F	_
m	Mastered	5	4		2	2	2	-
а	Accomplished			4	2			
р	Proficient			1				
g	Marginal		1					
i	incompetent				1	3	3	

Evaluation of the objective are as follows:

Objective "A" had one student ranking as accomplished.Objective "B" had 4 students ranking as mastered and one as marginal.

Objective "C" had 4 students ranking as accomplished and one as proficient.
Objective "D" had 2 students ranking as mastered, 2 as accomplished, and one as incompetent.
Objective "E" had 2 students ranking as mastered and 3 as incompetent.
Objective "F" had 2 students ranking as mastered and 3 as incompetent.

The incompetent counts were due to students not turning in a portion of the work.

ETCM 4368 – Cost Estimating Assessment Rubric

Objective			Measures		
	incompetent	marginal	proficient	accomplished	mastered

A	Demonstrate the use of and proficiency in construction mathematics.	10%	Struggles with basic mathematics and is incapable of computing quantities.	Uses reference material to get formulas for performing construction math.	Computes quantities but slow to analyze and use appropriate methods	Identifies appropriate methods and compute quantities with little error.	Identifies appropriate methods and compute quantities in swiftly and accurately
В	Identify components and costs of components contained in residential and commercial projects.	20%	Cannot identify basic building materials on plans or within documents	Has limited knowledge of building materials	Can identify basic building components on plans and within documents but slow to locate the items.	Identifies basic building materials on plans and within documents.	Identifies basic building materials on plans and within documents in a swift and accurate manner.
С	Identify time-valued components in a construction project.	10%	Cannot calculate how long it take to perform a construction task	Struggles with calculating task time.	Computes time to complete construction activities for tasks and jobs.	Evaluates and computes completion times with little error.	Computes time-valued components swiftly and accurately
D	Prepare construction material cost estimates.	20%	Cannot identify quantities or compute cost of materials, labor and equipment	Overlooks obvious items when preparing estimates.	Calculates construction costs and understands the concepts of pricing material, labor, and equipment	Calculates construction costs with little error.	Calculates construction costs quickly and accurately
E	Prepare construction schedule and analysis.	30%	Cannot create a construction schedule with parallel tasks	Can prepare Gantt chart but does not include significant task details.	Can prepare a construction schedule using parallel tasks but struggles with modifications when in tracking mode	Prepares construction schedules with sufficient accuracy and can track work completed.	Prepares complex construction schedules and can analyze for modifications in tracking mode
F	Demonstrate proper and effective use of sketching / drawing and writing to convey ideas and documentation.	10%	Lacks ability to express ideas visually or in writing.	Has trouble with describing things accurately using drawing and sketches.	Can sketch/draw to express idea and can describe adequately in writing	Conveys ideas using sketches/drawings and writing.	Expresses ideas using sketches/drawings and in writing in a concise and fluent manner
		Grade:	0 - 60	61 - 70	71 - 80	81 - 90	91 - 100

## **Findings Description:**

ETCM 4368 – Cost Estimating was offered in the Spring 2021 semester. The course provided students with the opportunity to apply their estimating knowledge to fictitious projects. The semester was hampered by the COVID-19 pandemic and was offered in a hybrid delivery (students attended inperson one day a week and attended remotely the other day). Five students elected to attend class remotely due to family health risk concerns and several students had to quarantine during the semester. Lack of remote access to MS Project required students to attend class to perform scheduling assignments.

The course had 27 students of which 23 students were construction management majors. From those 23 construction management students, a random sample of 5 students was obtained. An evaluation was made based on their comprehensive final examination grading consisting of an estimation project work. The final exam had a section to assess the students' knowledge in basic construction math and unit conversion. A final project assessed takeoff and pricing, bid tabulation, and project scheduling.

	Exam S	Exa	am		
Ι	II	III	IV	Score	Grade
1	.850	.750	.250	2.85	С
1	1	.583	.750	3.33	В
1	.850	.750	.250	2.85	С
1	1	.583	.750	3.33	В
1	.850	.750	.250	2.85	С

Section

- I Basic construction math and unit conversion
- II Pricing including material and
- work take-off
- III Bid tabulation
- IV Project schedule

## An evaluation was made based on the Assessment Rubric for each of the selected students exam work and their ranking is shown below.

	Rubric objectives				
Α	в	С	D	Е	F
m	а	а	р	m	а
m	m	m	m	m	а
m	а	а	р	m	а
m	m	m	а	m	а
m	а	а	р	m	а

	W	eighte	d Rubr	ic Obje	ectives	
0.1	0.2	0.1	0.2	0.3	0.1	
4	3	3	2	4	3	2.975

	4	4	4	4	4	3	3.6
	4	3	3	2	4	3	2.9
	4	4	4	3	4	3	3.4
	4	3	3	2	4	3	2.9
	Rub	ric Co	unts				
	А	в	С	D	Е	F	_
stered	5	2	2	1	5		

m	Mastered	5	2	2	1	5	
а	Accomplished		3	3	1		5
р	Proficient				3		
g	Marginal						
i	incompetent						

Evaluation of the objective are as follows:

Objective "A" had five students ranking as mastered.

Objective "B" had two students ranking as mastered and three as accomplished.

Objective "C" had two students ranking as mastered and three as accomplished.

Objective "D" had 1 student ranking as mastered, 1 as accomplished, and 3 as proficient.

75

Objective "E" had five students ranking as mastered.

Objective "F" had five students ranking as accomplished.

The incompetent counts were due to students not turning in a portion of the work.

#### **RELATED ITEM LEVEL 3**

#### ETCM 4368 Cost Estimation- Knowledge and Skills

#### **Action Description:**

Continue assessment and development practices in Cost Estimation of construction materials to foster the development of construction management knowledge and skills

## **Develop Professional Skills**

## **Goal Description:**

Students will gain necessary work force experience to compete in the construction field.

#### **Providing Department:** Construction Management BS

RELATED ITEMS/ELEMENTS

#### **RELATED ITEM LEVEL 1**

## **Demonstrate Professional Skills**

#### **Learning Objective Description:**

Students completing the BS in Engineering Technology will demonstrate skills necessary to compete in the professional marketplace through an internship.

- Students completing the BS in Engineering Technology will demonstrate skills necessary to compete in the professional marketplace through an internship.

- Students will establish a professionalism to be ready to start their successful careers in each professional field through an internship.
- Students will improve their written, oral, and graphical communication skills with stakeholders in each professional field to maintain professional working relationships.
- At the conclusion of these courses, the student will have demonstrated successfully the following competencies:

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. Develop the required reports and maintain progressive reviews that identify the progress being made on the project.
- 4. Supervise workers in the various trades that are under their responsibilities.
- 5. Write change orders on specification sheets.
- 6. Prepare project documents and resources to support the activities for a project.
- 7. Communicate with subcontractors and maintain professional working relationships.
- 8. Write and maintain punch list and other required documentation.
- 9. Exhibit characteristics associated with successful employment in industry.

#### **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 (Junior or Senior) 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.

Students need to meet the below student eligibility to register ETEC4391 for 3 credits or 6 credits.

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 2020 were evaluated by the following detail rubric:

#### **COURSE EVALUATION – GRADING: 100 POINT SCALE**

Weekly Reports [10 weekly reports]	20 Points
Summary of Syllabus	3 Points
Resume	3 Points
LinkedIn	2 Points
EMAIL Communication Skills	2 Points
ONLINE Video Review and Summary (1 video)	10 Points
FINAL SUMMARY PAPER	20 Points
FINAL SUMMARY PRESENTATION	20 Points
Supervisor's Evaluation	15 Points
Supervisor's working hour verification letter	5 Points
TOTAL	100 Points

Grade Scale - Final grades will be based upon the following points.

Your final numerical point will ROUND OFF to THE NEARNEST WHOLE NUMBER.

A = +90 Points

B = 80 - 89 Points

C = 70 - 79 Points

D = 60 - 69 Points

F = under 60 Points

#### **Criterion Description:**

It is expected that at least 85% of the students enrolled in ETEC 4391 will achieve above average standard (B or higher) of performance on the supervisor evaluation rating scale and the final letter grade. 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 to Blackboard by the specific due dates as below.

Assignments	Due Dates
10 Westelse Deveste	By Midnight, Every Following Sunday
10 weekly Reports	i.e.: The 1st Weekly Report (May 28-30) - By Midnight, May 31, 2020
Summary of Syllabus	By Midnight on May 31, 2020
Resume	By Midnight on May 31, 2020
LinkedIn	By Midnight on Jun. 7, 2020
Online Video Review and Summary (1 Video)	By Midnight on Jul. 28, 2020
EMAIL Communication Shills	No due date. (Based on the communication between a student and the
EMAIL Communication Skills	instructor)
Final Summary Paper	By Midnight on Jul. 26, 2020
Final Summary Presentation	By Midnight on Jul. 26, 2020
Supervisor's Evaluation	By Midnight on Jul. 20, 2020
Supervisor's working hour confirmation letter	By Midnight on Jul. 20, 2020

#### **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		
	-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.		
2.7	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.		
Directly supported learning objectives and student outcomes:	<ul> <li>Students will establish a professionalism to be ready to start their successful careers in each professional field through an internship.</li> <li>4.Develop the required reports and maintain progressive reviews that identify the progress being made on the project.</li> <li>5.Supervise workers in the various trades that are under their responsibilities.</li> <li>6.Write change orders on specification sheets.</li> <li>7.Prepare project documents and resources to support the activities for a project.</li> </ul>	
	-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 (%)
А	84.3%
В	5.9%
С	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**

The BS in Construction Management program has just been accredited by the ABET ANSAC commission. 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.

## 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

## **New Plan for Continuous Improvement Item**

## **Closing Summary:**

The BS in Construction Management program has just been accredited by the ABET ANSAC commission. 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.