



 **SUNY CANTON**

Mechanical Engineering Technology (AAS)
Canino School of Engineering Technology
Fall 2015 Assessment Report



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Date of Presentation: January 15, 2015

What was assessed? Student learning outcomes list:

- **SLO 1 - The ability to use commercially accepted computer aided design (CAD) software to produce industrially accepted drawings and to read industrial prints, applying current industrial standards. (ABET: a,b,f)**
- **SLO 2 - The ability to set up, operate and program CNC equipment. (ABET: a, i)**
- **SLO 3 - The ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge (ABET: b)**
- **SLO 4 - The ability to produce written documents and deliver oral-visual presentations using current industrially accepted standards and software. (ABET: f)**
- **SLO 5 - The ability to work effectively in teams and support an argument to defend a position. (ABET: d)**
- **SLO 6 - The ability to use test equipment to effectively diagnose and resolve problems related to AC/DC electricity, industrial instrumentation and programmable logic controllers (PLC's) and to conduct, analyze, and interpret experiments. (ABET: c)**



What was assessed? Student learning outcomes list: (Cont.)

- **SLO 7 - The ability to resolve fundamental problems related to: materials, statics, shear and moment diagrams, and design mechanical components using nondestructive failure theories. (ABET: e)**
- **SLO 8 - The ability to solve hydraulic, pneumatic, or fluid problems and work with design, installation, and maintenance of such systems.(ABET: a)**
- **SLO 9 - An understanding of the need for and an ability to engage in self-directed continuing professional development (ABET: g)**
- **SLO 10 - An understanding of and a commitment to addressing professional and ethical responsibilities, including a respect for diversity (ABET: h)**
- **SLO 11 - A commitment to quality, timeliness, and continuous improvement. (ABET: i)**



Where were outcomes assessed?

- **SLO 1 - The ability to use commercially accepted computer aided design (CAD) software to produce industrially accepted drawings and to read industrial prints, applying current industrial standards. (ABET: a,b,f)**
MECH242, SOET116, SOET250
- **SLO 2 - The ability to set up, operate and program CNC equipment. (ABET: a, i).**
MECH121
- **SLO 3 - The ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge (ABET: b).**
ENGS101, ENGS102, MECH121, MECH241
- **SLO 4 - The ability to produce written documents and deliver oral-visual presentations using current industrially accepted standards and software. (ABET: f).**
ENGS101, ENGS102



Where were outcomes assessed?

- **SLO 5 - The ability to work effectively in teams and support an argument to defend a position. (ABET: d).**
ENGL101, ENGS101, MECH221, MECH242, PHYS121, PHYS125
- **SLO 6 - The ability to use test equipment to effectively diagnose and resolve problems related to AC/DC electricity, industrial instrumentation and programmable logic controllers (PLC's) and to conduct, analyze, and interpret experiments. (ABET: c).**
ELEC261, ENGS101, ENGS102, MECH221, PHYS121, PHYS125
- **SLO 7 - The ability to resolve fundamental problems related to: materials, statics, shear and moment diagrams, and design mechanical components using nondestructive failure theories. (ABET: e)**
CONS172, CONS272, ELEC141, ENGS101, MECH221,
- **SLO 8 - The ability to solve hydraulic, pneumatic, or fluid problems and work with design, installation, and maintenance of such systems.(ABET: a)**
MECH241, MECH242



Where were outcomes assessed?

- **SLO 9 - An understanding of the need for and an ability to engage in self-directed continuing professional development (ABET: g)**
ENGL101, SOET116, SOET250
- **SLO 10 - An understanding of and a commitment to addressing professional and ethical responsibilities, including a respect for diversity (ABET: h)**
ENGS101, MECH221, SOET116, SOET250
- **SLO 11 - A commitment to quality, timeliness, and continuous improvement. (ABET: i)**
ENGS101, MECH241, SOET116



How was the assessment accomplished?

- Student work assessed:
 - Midterm and final exam short answer questions
 - Calculations exams
 - Oral presentations
 - Research papers
- Measurement strategy:
 - rubrics, research papers
 - % of questions answered correctly on calculations exam and midterm/final exams
- Sample size:
 - Varies by course



SO 1 - The ability to use commercially accepted computer aided design (CAD) software to produce industrially accepted drawings and to read industrial prints, applying current industrial standards. (ABET: a,b,f).

	Measures	Not Met		Met		Exceeded	
		N	%	N	%	N	%
All Courses	17	2	12%	6	35%	9	53%
ENGS 102	10	1	10%	3	30%	6	60%
MECH 112	Not Taught Fall 2015						
MECH 223	Not Taught Fall 2015						
MECH 242	1	0	0%	0	0%	1	100%
SOET 116	5	1	20%	3	60%	1	20%
SOET 250	1	0	0%	0	0%	1	100%

Note: Mapping Error – ENGS 102 does not belong in this SO. This SO is not a problem now since >70% meet or exceed, but caution prevails and improvement can be sought



SO 2 - The ability to set up, operate and program CNC equipment. (ABET: a, i).

	Measures	Not Met		Met		Exceeded	
	<u>N</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
All Courses	1	0	0%	0	0%	1	100%
MECH 121	1	0	0%	0	0%	1	100%
MECH 223	Not Taught Fall 2015						

Note: No issues with this SO



SO 3 - The ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge (ABET: b).

	Measures	Not Met		Met		Exceeded	
	<u>N</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
All Courses	22	10	45%	7	32%	5	23%
ENGS 101	8	4	50%	3	38%	1	13%
ENGS 102	6	2	33%	1	17%	3	50%
MECH 121	1	1	100%	0	0%	0	0%
MECH 241	7	3	43%	3	43%	1	14%

Students are having trouble using math and science to solve engineering technology problems



SO 4 - The ability to produce written documents and deliver oral-visual presentations using current industrially accepted standards and software. (ABET: f).

	Measures	Not Met		Met		Exceeded	
	<u>N</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
All Courses	18	5	28%	8	44%	5	28%
ENGS 101	14	5	36%	7	50%	2	14%
ENGS 102	4	0	0%	1	25%	3	75%
MECH 103	Not Taught Fall 2015						

ENGS101 is the introductory course. ENGS102 is improperly mapped and does not belong and MECH220, MECH242 need to be included in mapping



SO 5 - The ability to work effectively in teams and support an argument to defend a position. (ABET: d).

	Measures		Not Met		Met		Exceeded		
	<u>N</u>		<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
All Courses	17		2	12%	3	18%	10	59%	
ENGL 101	10		1	10%	1	10%	7	70%	
ENGS 101	2		0	0%	1	50%	1	50%	
MECH 128	Not Taught Fall 2015								
MECH 221	1		0	0%	0	0%	0	0%	
MECH 223	Not Taught Fall 2015								
MECH 232	Not Taught Fall 2015								
MECH 242	1		1	100%	0	0%	0	0%	
PHYS 121	1		0	0%	0	0%	1	100%	
PHYS 122	No Measures, No Findings								
PHYS 125	2		0	0%	1	50%	1	50%	
PHYS 126	No Measures, No Findings								

MECH221 is suppose to be MECH220, Data was not entered correctly for MECH242 as this was not 100% not met.



SO 6 - The ability to use test equipment to effectively diagnose and resolve problems related to AC/DC electricity, industrial instrumentation and programmable logic controllers (PLC's) and to conduct, analyze, and interpret experiments. (ABET: c).

	Measures	Not Met		Met		Exceeded	
	<u>N</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
All Courses	20	5	25%	7	35%	7	35%
ELEC 261	3	3	100%	0	0%	0	0%
ENGS 101	5	1	20%	4	80%	0	0%
ENGS 102	2	0	0%	1	50%	1	50%
MECH 103	Not Taught Fall 2015						
MECH 128	Not Taught Fall 2015						
MECH 221	1	0	0%	0	0%	0	0%
MECH 232	Not Taught Fall 2015						
PHYS 121	3	1	33%	1	33%	1	33%
PHYS 122	No Measures, No Findings						
PHYS 125	6	0	0%	1	17%	5	83%
PHYS 126	No Measures, No Findings						

Mapping in task stream incorrect and needs updating



SO 7 - The ability to resolve fundamental problems related to: materials, statics, shear and moment diagrams, and design mechanical components using nondestructive failure theories. (ABET: e).

	Measures	Not Met		Met		Exceeded	
	<u>N</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
All Courses	7	1	14%	3	43%	2	29%
CONS 172	1	0	0%	0	0%	1	100%
CONS 272	2	1	50%	1	50%	0	0%
ELEC 141	1	0	0%	0	0%	1	100%
ENGS 101	2	0	0%	2	100%	0	0%
MECH 221	1	0	0%	0	0%	0	0%
MECH 232	Not Taught Fall 2015						

Mapping in task stream incorrect and needs updating. Issue with CONS272



SO 8 - The ability to solve hydraulic, pneumatic, or fluid problems and work with design, installation, and maintenance of such systems.(ABET: a).

	Measures		Not Met		Met		Exceeded	
	<u>N</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
All Courses	7	4	57%	1	14%	2	29%	
MECH 103	Not Taught Fall 2015							
MECH 128	Not Taught Fall 2015							
MECH 241	5	3	60%	1	20%	1	20%	
MECH 242	2	1	50%	0	0%	1	50%	

Since students have difficulty applying math and science to solving engineering related problems the issue became even more evident in SO#8



SO 9 - An understanding of the need for and an ability to engage in self-directed continuing professional development (ABET: g).

	Measures	Not Met		Met		Exceeded	
	<u>N</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
All Courses	11	5	45%	4	36%	2	18%
ENGS 101	9	5	56%	3	33%	1	11%
MECH 112	Not Taught Fall 2015						
MECH 232	Not Taught Fall 2015						
SOET 116	1	0	0%	1	100%	0	0%
SOET 250	1	0	0%	0	0%	1	100%

Have to dig into ENGS101 and determine if this was actually addressed in the class



SO 10 - An understanding of and a commitment to addressing professional and ethical responsibilities, including a respect for diversity (ABET: h).

	Measures	Not Met		Met		Exceeded	
	<u>N</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
All Courses	11	4	36%	3	27%	2	18%
ENGS 101	8	4	50%	2	25%	2	25%
MECH 112	Not Taught Fall 2015						
MECH 221	1	0	0%	0	0%	0	0%
MECH 223	Not Taught Fall 2015						
MECH 232	Not Taught Fall 2015						
SOET 116	1	0	0%	1	100%	0	0%
SOET 250	1	0	0%	0	0%	0	0%

Mapping of this outcome is incorrect in task stream and better measured need to applied



SO 11 - A commitment to quality, timeliness, and continuous improvement.
(ABET: i).

	Measures		Not Met		Met		Exceeded	
	<u>N</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
All Courses	14	5	36%	7	50%	2	14%	
ENGS 101	6	3	50%	2	33%	1	17%	
MECH 112	Not Taught Fall 2015							
MECH 223	Not Taught Fall 2015							
MECH 232	Not Taught Fall 2015							
MECH 241	2	1	50%	1	50%	0	0%	
SOET 116	6	1	17%	4	67%	1	17%	

Mapping of this outcome is incorrect in task stream and better measured need to applied



Assessment results: What have the data told us?

1. Definition of SO's in Task Stream are outdated and need to be revised to align with current ABET definitions.
2. Course Mapping in task stream is incorrect and needs revision. With out this the data that is produced automatically is useless and warrants incredible manual time digging through individual courses
3. Some course SLO's need revision and some courses need additional SLO's for better clarity in mapping within task stream and ABET criteria
4. CONS272 has an issue with SO# 7
5. Students struggle with the application of Math and Science in Engineering related problems



Data-driven decisions: How the department has or plans to “close the loop” based on these results.

- Revise SO’s in task stream to align the numbering with ABET a thru k
- Remap courses to properly align with program outcomes
- Revise some of the courses SLO’s to include areas that are missing and rewrite other SLO’s to offer better clarity and definition (e.g the SO for professional and ethical responsibilities needs to be linked to MECH121, MECH232, MECH112 to include categories of hazardous waste, design and environmental responsibilities, design standards)



What resources were used or have been requested to close the loop?

- Department needs more faculty (2 tenured track faculty can not adequately serve the needs of both the 2 year and 4 year MET program. In 1987 we had 5 full time tenured faculty serving only a 2 year program, today we added the 4 year program and only have 2 faculty)
- Still looking for the faculty replacement for last year's resignation of Lin Tian
- Release time is needed to adequately implement the full functionality of Taskstream and the assessment cycle
- Department funds are non existent to purchase minimum supplies to support a growing enrollment (-\$200 (yes negative) does not keep up with inflation when in 1987 we received \$7500 for supplies for a 2 year program and now we have added the 4 year program)

