

FY 2016 Enrollment: 489; Graduates: 31

Bachelor of Science in Electrical Engineering Technology

Program Educational Objectives

Program Educational Objectives (PEOs) are broad statements that describe what graduates are expected to attain within a few years of graduation. Program Educational Objectives are based on the needs of the program's constituencies.

PEO 1: Apply general and discipline-specific concepts and methodologies to identify, analyze and solve technical problems in the electrical discipline.

PEO 2: Demonstrate an individual desire and commitment to remain technically current with, and adaptive to, changing technologies through continuous learning and self-improvement.

PEO 3: Demonstrate independent thinking, function effectively in team-oriented settings, and maintain a high level of performance in a professional/industrial environment.

PEO 4: Communicate effectively in a professional/industrial environment.

PEO 5: Perform ethically and professionally in business, industry and society.

PEO 6: Attain increasing levels of responsibility and leadership in the electrical field.

Program / Student Learning Outcomes: What Will I Learn?

Select an outcome statement to see the related measures and results.

Graduates of the Bachelor of Science in Electrical Engineering Technology will be able to:

1. Select and apply appropriate knowledge, techniques, skills, and modern tools of mathematics, engineering technology, and natural sciences, including physics, to solve problems in electrical engineering technology areas.
2. Demonstrate the ability to test, measure, and provide quantitative expressions of natural science phenomena, including experimentation, observation, and accurate measurement.
3. Apply the fundamentals of algebra, trigonometry, and calculus to problem solving in electrical engineering technology areas.
4. Make oral technical presentations in Standard English using graphics and language appropriate to the audience.
5. Demonstrate proficiency in the written and graphical communication of technical information supported by appropriate technical references using Standard English.
6. Demonstrate a working knowledge of computer usage, including knowledge of one or more computer languages or documentation of the use of one or more computer software packages for technical problem solving appropriate to the electrical engineering technology discipline.
7. Demonstrate technical competency in the core electrical engineering technologies, including electronics, circuit analysis, and digital systems, and in the student's chosen concentration such as electronics, power systems, or nanotechnology.
8. Integrate knowledge of the functional areas of electrical engineering technology from a variety of resources.
9. Demonstrate the ability to analyze, apply design concepts, and implement systems as appropriate to electrical engineering technology and consider their societal and global impact.

10. Participate effectively in groups as a member or leader, and apply project management techniques as appropriate to complete assignments.
11. Demonstrate understanding and commitment to professional, ethical, and social responsibilities, including the effects of culture, diversity, and interpersonal relations.
12. Demonstrate a commitment and ability to continue to engage in self-directed continuing professional development.
13. Demonstrate a commitment to quality, timeliness, and continuous improvement.

Assessment Methodology

Metrics, Assessments, and Levels of Achievement

The table below provides a brief overview of the measures selected to assess program outcomes for the Bachelor of Science in Electrical Engineering Technology program. Assessment of program outcomes includes both direct and indirect measures. Benchmarks have been established to differentiate between three levels of program outcome achievement (highly achieved, meets standard, and needs improvement). These three levels of achievement are color coded and used in the section below to indicate the level of achievement for each measure, for each learning outcome.

Metric Type	Direct Measures		Indirect Measures	
	Capstone Course	Course-Embedded	Exit Alumni Survey	One-Year Post-graduation Alumni Survey*
Assessments				
Metrics	The percentage of the ELEC 495 students who receive a grade of 2 (out of 3) or higher on the Capstone Rubric for its designated program outcome.**	The percentage of the students who receive a grade of B or higher on two selected course embedded assessments.	The mean of the graduates' perceptions of their achievement of the related program outcomes (on a 6-pt Likert-type scale).	The mean of the graduates' perceptions of their achievement of the related program outcomes (on a 6-pt Likert-type scale).
Highly Achieved	≥ 85%		Mean ≥ 5%	
Meets Standard	70 - 84%		4.0 - 4.99	
Needs Improvement	< 70%		Mean < 4	

Note: The results of the one-year post-graduation survey are used as a reference to provide a longitudinal perspective on students' attainment of program (student) outcomes.

**No data points were obtained for this instrument in the evaluation period.*

*** ELEC 495 was revised to incorporate a project in addition to the portfolio, prior to the start of the Spring 2016 term. Data from Spring 2016 is not included in the direct measures because the new rubrics were not comparable. The new data was reviewed separately. Although, the capstone exam remained the same, resulting in a larger sample size than what is seen in the direct measures.*

Key:

Result
N

Program Outcome Achievement Results

May 2015 Term to March 2016 Term

Program / Student Learning Outcome 1

Select and apply appropriate knowledge, techniques, skills, and modern tools of mathematics, engineering technology, and natural sciences, including physics, to solve problems in electrical engineering technology areas.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	95%	Exit Survey	5.15
	n = 22		n = 13
M1A1 in ELEC 152 Circuit Theory I	97%		
	n = 76		
M1A1 in ELEC160 Electronics I	95%		
	n = 59		

Program / Student Learning Outcome 2

Demonstrate the ability to test, measure, and provide quantitative expressions of natural science phenomena, including experimentation, observation, and accurate measurement.

Direct Measure	Indirect Measure
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Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.08
	n = 22		n = 13
M6A2 in ELEC160 Electronics I	96%		
	n = 51		
M1A3 in ELEC161 Electronics II	98%		
	n = 42		

Program / Student Learning Outcome 3

Apply the fundamentals of algebra, trigonometry, and calculus to problem solving in electrical engineering technology areas.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	4.92
	n=22		n=13
Final Exam in ELEC161 Electronics II	100%		
	n=65		
M1A2 in ELEC153 Circuit Theory II	88%		
	n=58		

Program / Student Learning Outcome 4

Make oral technical presentations in Standard English using graphics and language appropriate to the audience.

Direct Measure		Indirect Measure	
	100%		5.31

Capstone Rubric ELEC 495 Integrated Technology Assessment	n = 21	Exit Survey	n = 13
M8A5 Group Project in ELEC161 Electronics II	96%		
	n = 54		
M8A2 Project in ELEC307 Microcontrollers	91%		
	n = 11		

Program / Student Learning Outcomes 5

Demonstrate proficiency in the written and graphical communication of technical information supported by appropriate technical references using Standard English.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.38
	n=21		n=13
M8A1 in ELEC201 Digital Electronics	88%		
	n=48		
M7A3 Lab in ELEC153 Circuit Theory II	91%		
	n=44		

Program / Student Learning Outcomes 6

Demonstrate a working knowledge of computer usage, including knowledge of one or more computer languages or documentation of the use of one or more computer software packages for technical problem solving appropriate to the electrical engineering technology discipline.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.38

	n=22		n=13
M6A3 in ELEC152 Circuit Theory I	95%		
	n=62		
M3A3 in ELEC152 Circuit Theory I	90%		
	n=68		

Program / Student Learning Outcomes 7

Demonstrate technical competency in the core electrical engineering technologies, including electronics, circuit analysis, and digital systems, and in the student's chosen concentration such as electronics, power systems, or nanotechnology.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.08
	n = 22		n = 13
M5A2 Lab in ELEC307 Microcontrollers	92%		
	n = 12		
Final Exam in ELEC161 Electronics II	100%		
	n = 65		

Program / Student Learning Outcomes 8

Integrate knowledge of the functional areas of electrical engineering technology from a variety of resources.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.00
	n=22		n = 13
M4A3 in ELEC201 Digital Electronics	81%		

	n=57
M7A2 in ELEC161 Electronics II	98%
	n=62

Program / Student Learning Outcomes 9

Demonstrate the ability to analyze, apply design concepts, and implement systems as appropriate to electrical engineering technology and consider their societal and global impact.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.15
	n = 22		n = 13
M7A1 Textbook Activity in ELEC201 Digital Electronics	73%		
	n = 60		
M5A2 in ELEC153 Circuit Theory II	94%		
	n = 52		

Program / Student Learning Outcomes 10

Participate effectively in groups as a member or leader, and apply project management techniques as appropriate to complete assignments.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.00
	n=22		n=13
M8A5 in ELEC161 Electronics II	96%		
	n=54		

M8 Group Lab Project in ELEC321 Control Systems	76%
	n=21

Program / Student Learning Outcomes 11

Demonstrate understanding and commitment to professional, ethical, and social responsibilities, including the effects of culture, diversity, and interpersonal relations.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.15
	n=21		n=13
M8A2 in ELEC161 Electronics II	100%		
	n=63		
M5D2 in ELEC152 Circuit Theory I	82%		
	n=65		

Program / Student Learning Outcomes 12

Demonstrate a commitment and ability to continue to engage in self-directed continuing professional development.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.31
	n=22		n=13
M8A3 in ELEC161 Electronics II	100%		
	n = 63		
M8D1 in ELEC153 Circuit Theory II	90%		

	n=48
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Program / Student Learning Outcomes 13

Demonstrate a commitment to quality, timeliness, and continuous improvement.

Direct Measure		Indirect Measure	
Capstone Rubric ELEC 495 Integrated Technology Assessment	100%	Exit Survey	5.23
	n = 22		n = 13
M8A4 in ELEC161 Electronics II	100%		
	n = 62		
M8A1 Group Lab Project in ELEC306 Advanced Digital Design	100%		
	n = 14		

Capstone Exam Results

A comprehensive capstone examination has been administered to all baccalaureate degree students at the conclusion of the ELEC 495 Integrated Technology Assessment since September 2010. The capstone examination consists of 118 objective questions that assess the most common and most important topics and skills in six core content areas within the College's baccalaureate degree electrical engineering technology curriculum.

From May 2015 term to March 2016 term, the total number of students who took the capstone exam was 26. The mean score on each of the program's core content areas is shown below:

- 88.2% - Basic Concepts of Electricity
- 63.0% - Alternating Current Circuit Concepts
- 57.1% - Basic Circuit Analysis Methods
- 78.6% - Digital Electronics
- 65.5% - Analog Electronics
- 71.7% - Microcontrollers and Microprocessors