FY 2020 Enrollment: 304; Graduates: 206

Bachelor of Science in Nuclear 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 nuclear discipline, including understanding and addressing the societal and institutional issues related to nuclear technology.
PEO 2: Demonstrate an individual desire and commitment to remain technical 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: Demonstrate and utilize leadership principles in the field of nuclear engineering technology.

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 Nuclear Engineering Technology will be able to:

1. Apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the nuclear engineering technology discipline.
2. Demonstrate an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the nuclear engineering technology discipline.
3. Apply written, oral, and graphical communications in broadly-defined technical and non-technical environments; and be able to identify and use appropriate technical literature.
4. Conduct standard tests, measurements, and experiments, and be able to analyze and interpret the results to improve processes.
5. Function effectively as a member as well as a leader on technical teams, and apply project management techniques in team project activities.
6. Demonstrate comprehension of currently applicable rules and regulations in the areas of: radiation protection, operations, maintenance, quality control, quality assurance, and safety.
7. Demonstrate an understanding of and commitment to professional, ethical, and social responsibilities, including the impacts of culture, diversity, and interpersonal relations.

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 Nuclear 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**	
Assessments	Capstone Course	Course-Embedded	Exit Alumni Survey	One-Year Post-graduation Alumni Survey
Metrics	The percentage of the NUC 495 students who receive a rating of satisfactory or higher on the given rubric criteria, for the related student 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.

Key:

Result
N

Program Outcome Achievement Results

May 2019 Term to March 2020 Term

Program / Student Learning Outcome 1

Apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the nuclear engineering technology discipline.

Direct Measure		Indirect Measure	
Capstone Rubric NUC 495 Integrated Technology Assessment	90%	Exit Survey	5.33
	n = 221		n = 9
M2A2 in NUC 330 Reactor Core Fundamentals	98%	One-Year Survey	5.67
	n = 47		n = 6
M3A1 in NUC 245 Thermodynamics	86%		
	n = 7		
M3A2 in NUC 211 Radiation Measurement Lab	91%		
	n = 11		
M8A1 in NUC 250 Introduction to Heat Transfer and Fluid Mechanics	100%		
	n = 6		

Program / Student Learning Outcome 2

Demonstrate an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the nuclear engineering technology discipline.

Direct Measure		Indirect Measure	
Capstone Rubric NUC 495 Integrated Technology Assessment	95% n = 211	Exit Survey	4.89 n = 9
M7A1 in NUC 323 Material Science	96% n = 50	One-Year Survey	5.83 n = 6
M2A1 in NUC 350 Plant Systems Overview	100% n = 155		

Program / Student Learning Outcome 3

Apply written, oral, and graphical communications in broadly-defined technical and non-technical environments; and be able to identify and use appropriate technical literature.

Direct Measure		Indirect Measure	
Capstone Rubric NUC 495 Integrated Technology Assessment	98% n = 213	Exit Survey	5.22 n = 9
M8A3 in NUC 323 Material Science	88% n = 153	One-Year Survey	5.83 n = 6
M8A2 in NUC 323 Material Science	91% n = 157		

Program / Student Learning Outcome 4

Conduct standard tests, measurements, and experiments, and be able to analyze and interpret the results to improve processes.

Direct Measure		Indirect Measure	
Capstone Rubric NUC 495 Integrated Technology Assessment	91% n = 222	Exit Survey	5.11 n = 9
M3A2 in NUC 245 Thermodynamics	100% n = 7	One-Year Survey	5.67 n = 6
M5A1 in NUC 211 Radiation Measurement Lab	100% n = 2		

Program / Student Learning Outcome 5

Function effectively as a member as well as a leader on technical teams, and apply project management techniques in team project activities.

Direct Measure		Indirect Measure	
Capstone Rubric NUC 495 Integrated Technology Assessment	99% n = 337	Exit Survey	5.22 n = 9
M6A1 in NUC 211 Radiation Measurement Lab	100% n = 7	One-Year Survey	5.83 n = 6
M4A1 in NUC 211 Radiation Measurement Lab	80% n = 10		

Program / Student Learning Outcome 6

Demonstrate comprehension of currently applicable rules and regulations in the areas of: radiation protection, operations, maintenance, quality control, quality assurance, and safety.

Direct Measure		Indirect Measure	
Capstone Rubric NUC 495 Integrated Technology Assessment	92% n = 204	Exit Survey	5.22 n = 9
M8A1 in NUC 350 Plant Systems Overview	97% n = 153	One-Year Survey	5.89 n = 9
M4A1 in NUC 271 Fundamentals of Reactor Safety	96% n = 139		

Program / Student Learning Outcome 7

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

Direct Measure		Indirect Measure	
Capstone Rubric NUC 495 Integrated Technology Assessment	88% n = 211	Exit Survey	5.44 n = 9
M6A3 in NUC330 Reactor Core Fundamentals	100% n = 46	One-Year Survey	5.78 n = 9
M6A1 in NUC 350 Plant Systems Overview	100% n = 153		

Capstone Exam Results

A comprehensive capstone examination has been administered to all baccalaureate degree students at the conclusion of the NUC 495 Integrated Technology Assessment since September 2010. The capstone examination consists of 120 objective questions that assess the most common and most important topics and skills in seven core content areas within the College's baccalaureate degree nuclear engineering technology curriculum.

From May 2019 term to March 2020 term, the total number of students who took the capstone exam was 229. The mean score on each of the program's core content areas is shown below:

- 81.5% - Basic Natural Sciences
- 76.2% - Experimentation and Lab Techniques
- 86.3% - Basic Mathematics and Applications
- 76.5% - Technical Problem Solving and Computer Usage
- 78.3% - Basic Nuclear Reactor Theory and Technology
- 85.9% - Health Physics and Radiation Aspects
- 82.7% - Nuclear Power Plant Operation and Maintenance