



NORTHERN ILLINOIS UNIVERSITY

# College of Engineering and Engineering Technology

*Department of Mechanical Engineering*

## Academic Program Assessment Plan

August 8, 2018

**Program: B.S. in Department of Mechanical Engineering**

### **1. Student Learning Outcomes**

The graduates of undergraduate mechanical engineering program will be prepared to attain the following outcomes:

- (1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- (2) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- (3) An ability to communicate effectively with a range of audiences.
- (4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- (5) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- (6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- (7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.



NORTHERN ILLINOIS UNIVERSITY

# College of Engineering and Engineering Technology

*Department of Mechanical Engineering*

## 2. Explanation of Methods

The following chart lists the methods used, as well as a description of each method, the timeline or implementation, the person responsible, and the objectives each method addresses.

The following chart lists the methods used, as well as a description of each method, the timeline or implementation, the person responsible, and the objectives each method addresses.

Method	Direct/Indirect	Description/Target	Timeline	Person Responsible	Objectives Addressed
Course and Program Outcome Assessment	Direct	<p>The instructors conduct assessment of course outcomes based on outcome performance criteria rubrics and using a rating score of 1-4.</p> <p>Instructors submit a report of the student outcome in every semester.</p> <p>Homework, examinations and projects are considered as course embedded measures.</p> <p>Based on the analysis of these reports, the department conducts outcome assessment in the program level.</p> <p><b>Target:</b> 75 percent of students will meet all attain a score of 3&amp;4 in all outcomes.</p>	In Fall and Spring semester	Designated department faculty	1-7



NORTHERN ILLINOIS UNIVERSITY

# College of Engineering and Engineering Technology

*Department of Mechanical Engineering*

Capstone Design Project	Direct	<p>Each student is required to participate in senior design project and write a report which is evaluated by an instructor/advisor and a group of judges including faculty members.</p> <p><b><u>Written Report</u></b></p> <p>Students are required to submit the report as written documents for examination by the instructor/advisor</p> <p><b><u>Oral presentation</u></b></p> <p>Students are also required to make an oral presentation of the project on senior design day in an open seminar in front of the instructors/advisors, judges and other students and faculty.</p> <p>Senior design project are evaluated in every semester to measure the student outcomes using an evaluation form and using a rating score of 1-5</p> <p><b>Target:</b></p> <p>80% of students will attain a score of 3&amp;4 in all outcomes.</p>	Senior year	Designated department faculty	1-7
-------------------------	--------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------	-------------------------------	-----



NORTHERN ILLINOIS UNIVERSITY

# College of Engineering and Engineering Technology

*Department of Mechanical Engineering*

Internship Industrial employer survey	Indirect	Each semester the university conducted an internship industrial employer survey.  Score range from 1-5 are used for all Outcomes.	Each semester	University	1-7
<u>Student Survey</u>	Indirect	Survey form is used based on program outcomes. Score range from 1-5 are used for all Outcomes.  <b><u>Target:</u></b>  80% of students will attain a score of 3.5 out of 5 in all outcomes.	Each semester For all seniors on Senior design day		1-7
Alumni Survey	Indirect	Survey form is used based on program outcomes. Score range from 1-5 are used for all Outcomes.  <b><u>Target:</u></b>  80% of students will attain a score of 3.5 out of 5 in all outcomes.	In Fall semester	Designated department faculty	1-7
Employer Survey	Indirect	Survey form is used based on program outcomes. Score range from 1-5 are used for all Outcomes.  <b><u>Target:</u></b>  80% of students will attain a score of 3.5 out of 5 in all outcomes.			1-7



NORTHERN ILLINOIS UNIVERSITY

# College of Engineering and Engineering Technology

*Department of Mechanical Engineering*

## Outcomes-by Methods

The following chart demonstrates which outcomes are addressed by each method of assessment

Student learning outcomes	Course and Program Outcome Assessment (D)	Capstone Design project (D)	Internship Industrial employer survey (I)	Student Survey (I)	Alumni survey (I)	Employer Survey (I)
(1) An ability to identify, formulate, and solve complex engineering problems	x	x	x	x	x	x
(2) An ability to apply engineering design to produce solutions that meet specified needs	x	x	x	x	x	x
(3) An ability to communicate effectively with a range of audiences.	x	x	x	x	x	x
(4) An ability to recognize ethical and professional responsibilities	x	x	x	x	x	x
(5) An ability to function effectively on a team	x	x	x	x	x	x
(6) An ability to develop and conduct appropriate experimentation	x	x	x	x	x	x
(7) An ability to acquire and apply new knowledge	x	x	x	x	x	x