

Annual Assessment Report

Bachelor of Science in Industrial Engineering (BSIE)

1. BSIE Program Educational Objectives

The BSIE program educational objectives, as published on the INEG departmental website, are as follows:

Within 3-5 years of graduation, graduates of the University of Arkansas undergraduate program in industrial engineering will have:

1. successfully applied core industrial engineering knowledge and skills for industrial or public sector organizations,
2. successfully pursued advanced professional degrees, graduate studies in industrial engineering, professional development, or engineering certification, and
3. demonstrated ongoing professional and intellectual growth as managers and leaders in industrial engineering, society, and their communities.

2. BSIE Student Outcomes

ABET defines student outcomes to be “what students are expected to know and be able to do by the time of graduation.” The INEG faculty have elected to use (1) through (7) as the BSIE student outcomes. The following student outcomes will be referred to in assessment results in the following sections of this document.

- (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

3. Assessment of Key Course Outcomes

For every INEG course required for the BSIE other than INEG 2001 and INEG 4913/4924, the INEG faculty define at least one but no more than four key course outcomes, the technical skills and abilities that students develop during completion of a course. Key course outcomes and their mapping to the BSIE student outcomes in the set { (1), (2), (6) } are documented in the course’s syllabus of record. For each key course outcome, the continuous improvement team maintains a list of assessment questions with a corresponding answer key. During each offering of INEG 4924 Industrial Engineering Capstone Experience II, the capstone faculty coordinator administers to the students the assessment questions for all courses having key course outcomes. The goal for each BSIE student outcome in the set { (1), (2), (6) } is that at least 70% responses are correct. The results of responses only from capstone students for 2023-2024 are shown in Tables 1 and 2. The results of students answering the questions while taking the courses during 2023-2024 are shown in Table 3.

Table 1. 2023-2024 Student Outcome Outcomes Assessment Results for Capstone Students

BSIE Student Outcome	% Correct Responses from Capstone Students	Goal Met
(1)	71%	Yes
(2)	68%	No
(6)	67%	No

Table 2. 2023-2024 Key Course Outcomes Assessment Results for Capstone Students by Class

Course	% Correct			
	KCO1	KCO2	KCO3	KCO4
2103	89%	67%	77%	-
2214	75%	71%	-	-
2223	91%	63%	77%	-
2314	72%	71%	79%	52%
2323	89%	79%	67%	67%
2413	69%	61%	74%	-
2613	80%	57%	54%	-
3333	45%	60%	60%	-
3443	84%	60%	77%	-
3533	87%	69%	87%	-
3543	85%	63%	67%	-
3553	79%	44%	80%	-
3624	38%	25%	64%	56%
3714	90%	63%	90%	87%
3833	54%	54%	69%	-
4433	75%	65%	88%	-

Table 3. 2023-2024 Student Learning Outcomes Assessment Results for Students Enrolled in a Class During Reporting Period

Course	% Correct		
	(1)	(2)	(6)
2103	70%	-	69%
2214	91%	-	-
2223	99%	-	-
2314	65%	-	65%
2323	68%	68%	-
2413	73%	-	-
2613	63%	66%	59%
3443	80%	74%	74%
3533	84%	82%	82%
3543	91%	86%	-
3553	37%	35%	35%
3624	43%	68%	54%
3833	68%	67%	-
4433	64%	80%	-

4. Assessment of Supplemental Course Outcomes

For every INEG course required for the BSIE other than INEG 4913/4924 Industrial Engineering Capstone Experience I/II, the INEG faculty may define one or more supplemental course outcomes, the non-technical skills and abilities that students develop during completion of a course. Supplemental course outcomes and their mapping to one of the BSIE student outcomes in the set { (3), (4), (5) (7) } are documented in the course’s syllabus of record. Across all courses, at least two supplemental course outcomes must map to each BSIE student outcome in the set { (3), (4), (5) (7) }.

During each fall or spring offering of a course having supplemental course outcomes, the instructor administers the assessment mechanisms. For each mechanism, the instructor reports to the INEG ABET coordinator the number of students assessed and the number of students successfully demonstrating the outcome.

At the end of each academic year, the INEG ABET coordinator aggregates the results of supplemental course outcomes assessments. The goal for each BSIE student outcome in the set { (3), (4), (5), (7) } is that at least 70% of the corresponding assessment responses are successful. The results are shown in Table 4.

Table 4. 2023-2024 Supplemental Course Outcomes Assessment Results

Relevant BSIE Student Outcome	% of Students Demonstrating the Outcome	Goal Met
(3) Written	93%	Yes
(3) Oral	88%	Yes
(4)	90%	Yes
(5)	97%	Yes
(7)	70%	Yes

5. Assessment of Capstone Student Performance

As early as possible during each fall semester, the INEG faculty review and finalize a plan for the current academic year for assessing and evaluating all seven BSIE student outcomes as part of the INEG capstone experience (INEG 4913/4924 Industrial Engineering Capstone Experience I/II).

The activities in the capstone experience related to the assessment and evaluation of BSIE student outcomes are managed by the capstone faculty coordinator. The capstone coordinator provides to the INEG ABET coordinator a report that includes the results of the quantitative assessment and evaluation associated with that year’s capstone experience. The results are shown in Tables 5 and 6.

Table 7. 2023-2024 Team Achievement of BSIE Student Outcomes

BSIE Student Outcome	Average Rating	Goal	Goal Met
1	1.82	≥ 1.5	Yes
2	1.94	≥ 1.5	Yes
3	2	≥ 1.5	Yes
4	2	≥ 1.5	Yes
5	2	≥ 1.5	Yes
6	1.71	≥ 1.5	Yes
7	1.82	≥ 1.5	Yes

Table 8. 2023-2024 Individual Student Achievement of BSIE Student Outcomes

BSIE Student Outcome	Students with Average Rating ≥ 1.5	Goal	Goal Met
1	100%	$\geq 70\%$	Yes
2	100%	$\geq 70\%$	Yes
3	98%	$\geq 70\%$	Yes
4	100%	$\geq 70\%$	Yes
5	100%	$\geq 70\%$	Yes
6	98%	$\geq 70\%$	Yes
7	100%	$\geq 70\%$	Yes

6. Planned Changes

The faculty will meet to review the preceding results in August 2024. There are no degree/certificate changes planned from this review. The process itself will remain unchanged.