Annual Assessment Report

Bachelor of Science in Industrial Engineering and Operations Analytics (BSIEOA)

1. BSIEOA Program Educational Objectives

The BSIEOA 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. BSIEOA 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 BSIEOA 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 BSIEOA other than INEG 2001 and INEG 49103/49204, 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 BSIEOA 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. Near the end of each fall or spring offering of a course having key course outcomes, the instructor administers the assessment questions to the students. For each question, the instructor reports the number of students given the question and the number of correct responses. During each offering of INEG 49204 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 BSIEOA 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 2024-2025 are shown in Tables 1 and 2. The results of students answering the questions while taking the courses during 2024-2025 are shown in Table 3.

Table 1. 2024-2025 Student Outcomes Assessment Results for Capstone Students

BSIEOA Student Outcome	% Correct Responses from Capstone Students	Goal Met
(1)	81%	Yes
(2)	80%	Yes
(6)	76%	Yes

Table 2. 2024-2025 Key Course Outcomes Assessment Results for Capstone Students by Class

	% Correct			
Course	**KCO1**	**KCO2**	**KCO3**	**KCO4**
21003	95%	81%	85%	-
22104	83%	74%	-	-
22203	97%	82%	90%	-
23104	72%	79%	58%	84%
23203	95%	91%	82%	78%
24103	85%	75%	79%	-
26103	89%	56%	73%	-
33303	72%	76%	72%	-
34403	87%	59%	73%	-
35303	96%	93%	95%	-
35403	97%	83%	73%	-
35503	82%	64%	92%	-
36204	59%	33%	75%	64%
37104	97%	61%	94%	93%
38303	59%	70%	67%	-
44303	93%	75%	92%	-

Table 3. 2024-2025 Student Learning Outcomes Assessment Results for Students Enrolled in a Class During Reporting Period

	% Correct		
Course	**(1)**	**(2)**	**(6)**
21003	87%	-	90%
22104	79%	-	-
22203	90%	-	-
23104	73%	-	73%
23203	86%	86%	-
24103*	79%	-	-
26103	72%	81%	64%
33303*	-	-	74%
34403*	87%	66%	66%
35303	95%	94%	94%
35403	97%	78%	-
35503	79%	78%	78%
36204	54%	59%	69%
37104	93%	86%	83%
38303	67%	64%	-
44303	75%	93%	-

* These courses include Fall 2024 data only.

4. Assessment of Supplemental Course Outcomes

For every INEG course required for the BSIEOA other than INEG 49103/49204 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 BSIEOA 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 BSIEOA student outcome in the set { (3), (4), (5) (7) }.

The primary activities related to the assessment and evaluation of supplemental course outcomes are managed by continuous improvement teams. For each supplemental course outcome, the continuous improvement team provides a description of:

- how the students will be prepared to demonstrate the outcome
- the mechanism used to assess student attainment of the outcome

As early as possible during each fall semester, the INEG faculty review and finalize the assessment plans for all supplemental course outcomes for the current academic year. 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 the number of students assessed and the number of students successfully demonstrating the outcome.

At the end of each academic year, the results of supplemental course outcomes assessments are aggregated. The goal for each BSIEOA 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. 2024-2025 Supplemental Course Outcomes Assessment Results

Relevant BSIEOA Student Outcome	% of Students Demonstrating the Outcome	Goal Met
(3) Written	78%	Yes
(3) Oral	87%	Yes
(4)	91%	Yes
(5)	96%	Yes
(7)	83%	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 BSIEOA student

outcomes as part of the INEG capstone experience (INEG 49103/49204 Industrial Engineering Capstone Experience I/II).

The activities in the capstone experience related to the assessment and evaluation of BSIEOA student outcomes are managed by the capstone faculty coordinator. The capstone coordinator provides 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 5. 2024-2025 Team Achievement of BSIEOA Student Outcomes

BSIEOA Student Outcome	Average Rating	Goal	Goal Met
1	1.88	≥ 1.5	Yes
2	1.88	≥ 1.5	Yes
3	1.94	≥ 1.5	Yes
4	2	≥ 1.5	Yes
5	1.875	≥ 1.5	Yes
6	1.94	≥ 1.5	Yes
7	2	≥ 1.5	Yes

Table 6. 2024-2025 Individual Student Achievement of BSIEOA Student Outcomes

BSIEOA Student Outcome	Students with Average Rating ≥ 1.5	Goal	Goal Met
1	100%	≥ 70%	Yes
2	100%	≥ 70%	Yes
3	97%	≥ 70%	Yes
4	100%	≥ 70%	Yes
5	97%	≥ 70%	Yes
6	97%	≥ 70%	Yes
7	100%	≥ 70%	Yes

6. Planned Changes

The faculty will meet to review the preceding results in August 2025. There are no degree/certificate changes planned from this review. The process itself is expected to remain unchanged.