Eight-Year Program Review IBHE Report Summary: see attached Resources page

PROGRAM REVIEW REPORT SUMMARY

1.	**Reporting Institution**	**Eastern Illinois University**
2.	**Program Reviewed**	**B.S. in Engineering Cooperative**
3.	**Date**	**02-12-2025**
4.	**Contact Person**	**Dr. Jie Zou**
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5. OVERVIEW

The B.S. in Engineering Cooperative program is one of the three pre-engineering options at Eastern Illinois University (EIU). The three pre-engineering options are Pre-Engineering (2-2), Engineering Physics (3-2), and Engineering Cooperative (3-2). The first option is a two-year, non-degree program, in which students complete the first two years of an engineering curriculum and then transfer to an institution that awards a B.S. degree in engineering. The second and third options are dual-degree programs, in which students finish three years at EIU and then transfer to University of Illinois at Urbana-Champaign (UIUC) or Southern Illinois University at Carbondale (SIUC) (both have formal agreements with EIU). Upon receiving their engineering degree at UIUC or SIUC, students also receive a second B.S. degree from EIU.

The B.S. in Engineering Cooperative program, which is the focus of this review, is designed to provide students with a comprehensive education that includes a solid technical component in the math and sciences required of engineering students and a broad liberal arts component through the full general education requirements at EIU. The program is thus aligned with the mission of the University. The strength of the program, which is often missing in other engineering programs, is the broader liberal arts component that helps prepare our students to become well-rounded and successful professionals who are knowledgeable not only of the technical aspects but also of the engineering ethics and societal impact of engineering.

6. MAJOR FINDINGS AND RECOMMENDATIONS

6.a Description and assessment of any major changes in the program

(1) changes in the overall discipline or field

With the advancement of new technologies, engineering is a constantly changing field. For example, the recent breakthrough in artificial intelligence (AI) will make AI an increasingly important tool in the engineering design process. Engineering has also become more interdisciplinary. For example, in material engineering, physicists and engineers work together to discover innovative new material properties; in biomedical engineering, medical professionals and engineers work together to develop new medical devices, such as artificial organs. The changing or increasingly interdisciplinary nature of engineering does not have significant impact on the program curriculum. This is because the program provides the core of instruction, that is, math and sciences, which are the foundation for all engineering disciplines.

(2) student demand

The B.S. in Engineering Cooperative program remains the most popular among the three pre-engineering options at EIU in terms of the number of applicants. According to the data provided by the Office of Institutional Research, since 2017 (the last program review), the number of applicants to the program has increased from 292 in 2017 to 350 in 2024, a 20% increase. The number of applicants who were accepted by the University into the program has also increased by 52%. In recent Open Houses, we have seen potential students showing significantly more interest in pre-engineering (and engineering in general) compared to events in past years. Such an increased interest in engineering could be due to more awareness in the general public of the profound impact of engineering on society (see more in the next section).

(3) societal needs

According to the Occupational Outlook Handbook by the U.S. Bureau of Labor Statistics, "Overall employment in architecture and engineering occupations is projected to grow faster than the average for all occupations from 2023 to 2033." In May 2023, the median annual salary for the architecture and engineering occupations was about twice the median annual salary for all occupations. A recent publication, titled "Extraordinary Engineering Impacts on Society: Proceedings of a Symposium," by the National Academies of Sciences, Engineering, and Medicine in 2023, demonstrated the profound impact engineers have on society, including the economy, human health, and various aspects of our everyday lives. The societal need for engineers remains strong.

(4) institutional context for offering the degree

The major requirements and general education requirements of this program consist of courses that are required by other majors at EIU. As a result, there is essentially no additional cost due to the existence of the program.

There is also a significant overlap between the curriculum of this program and that of physics, chemistry, or electrical engineering, facilitating a smooth transition between this program and others within EIU. This smooth transition helps maintaining the overall student population at the University. Recently, we have seen that while UIUC remains a popular transfer destination for

students in the program, those who decided not to transfer to another engineering school transitioned to electrical engineering at EIU, and some decided to pursue a second major in chemistry at EIU before applying for transfer to UIUC.

(5) other elements appropriate to the discipline in question

Since the last program review in 2017, a major change relevant to the program is the addition of the B.S. in Electrical Engineering at EIU in 2020. Since then, we have seen a stronger student involvement in professional organizations, such as the American Society for Engineering Education (ASEE) and the Institute of Electrical and Electronics Engineers (IEEE). Such involvement will help our students become more informed engineers.

Curriculum-wise, PHY 1000 (Engineering Seminar) has changed to PHY 1001 (Introduction to Physics and Engineering). This change is consistent with the increasingly interdisciplinary nature of engineering, where physicists and engineers often work together for new discoveries.

Another change in the curriculum is the addition of EEN 1100 (Introduction to Logic Design) and EEN 1101 (Introduction to Logic Design Laboratory) to the required courses for the program. A main rationale for adding these two courses is to help students engaged in engineering design early, for example, in their first year of study, besides taking math and sciences courses.

6.b Description of major findings and recommendations, including evidence of learning outcomes and identification of opportunities for program improvement

A measure of the basic success of this program is the acceptance rate of our students into programs that award B.S. degrees in engineering. Since the last program review, a high percentage of our students who have applied for transfer to other institutions to complete their engineering degrees have been accepted into one or more engineering programs.

The quality of the program in preparing our students for success can also be measured by the academic records students achieve after they transfer to other engineering schools. A significant fraction of our students receives all "A" grades during one or more semesters at UIUC, SIUC, or other institutions. Positive feedback in the past from students include "I was better prepared for the upper division engineering courses than the students that spent their first two years at UIUC" and "The pre-engineering program has certainly served me well and has prepared me greatly for my engineering courses. I would not have been able to do as well as I have without it."

One area for program improvement is student recruitment. To that end, we had a productive meeting recently with representatives from the Office of Admissions. The goal of the meeting was to help admissions officers learn more about the pre-engineering, electrical engineering, and physics programs so that they could better showcase those programs to potential students. An opportunity for improvement that was identified during the meeting was the pre-engineering website. One question parents of potential students often ask at Open Houses or via email communications is "Where can I find the information?" Admissions Officers at the meeting also mentioned difficulty in finding information.

PAGE 2, IF NECESSARY: 6. MAJOR FINDINGS AND RECOMMENDATIONS

6.c Description of actions taken since the last review, including instructional resources and practices, and curricular

As mentioned in section 6.a (5), two curricular changes have been made. Please see details in that section.

6.d Description of actions to be taken as a result of this review, including instructional resources and practices, and curricular

As mentioned in section 6.b, the pre-engineering website will need to be improved to facilitate easy access to program information. We have designated a faculty member who will take in charge such improvement. We will also continue to work with the Admissions Office to help with student recruitment. Finally, an exit survey may be designed for students to fill out before they transfer to an engineering school to complete their engineering degree.

Comments from the College Dean:

The B.S. in Engineering Cooperative remains a successful program at EIU. The three pre-engineering options include Pre-Engineering (which is a 2+2 program), along with Engineering Physics and the Engineering Cooperative (which are both 3+2 programs). The second and third options are dual-degree programs, in which students finish three years at EIU and then normally transfer to UIUC or SIUC which have formal agreements with EIU. Since the last IBHE review, the number of applicants to the program has increased 20% from 292 in 2017 to 350 in 2024. The number of majors in the 3 programs has increased in the past few years to 19 in Fall 2024 which is up from Fall 2023 (13 majors) and Fall 2022 (10 majors). In terms of the anticipated societal need, employment in engineering occupations is projected to grow faster than the average from 2023 to 2033. Student feedback indicates that students felt well-prepared to pursue upper division coursework after transitioning to UIUC, SIUC, and other institutions. The program has made several curricular changes since the last report, and in addition, EIU has added programs in Electrical and Computer Engineering.

We recommend a decision of **Program in Good Standing.**

VPAA Decision:

- (●) Program in good standing
- ( ) Program flagged for priority review
- ( ) Program enrollment suspended

VPAA Explanation:

14.9999 B.S. in Engineering (Cooperative)

The summary above indicates progress on several fronts within the B.S. in Engineering (Cooperative) program. In order to respond to and meet the increasing demand for engineers in a variety of jobs, the program is working with Admissions officers to better advertise and promote their unique pathway to an engineering degree. The program also acknowledges the highly interdisciplinary nature of engineering work, thereby introducing its students to multiple fields such as chemical and electrical engineering. The program can now direct students into the attractive option of completing their undergraduate degree in the B.S. in Electrical Engineering program at EIU. Nevertheless, the program enjoys a high success rate of students who take their core math and science classes at EIU and then transfer in to larger engineering programs. The program needs to conduct regular exit and alumni surveys to capture the glowing reviews of students' preparation at EIU, especially as they indicate (in retrospect) their higher and more rigorous level of preparation than their peers at larger institutions.

EASTERN ILLINOIS UNIVERSITY

Resources for Completing the Eight-Year IBHE Program Review Report

Section 5. Overview

This section will focus the review for your reader.

In no more than half a page, please explain your program's mission and its relationship to Eastern's mission (and, if applicable, to the mission of graduate education). Identify similar programs in the state; distinguish your program from them. You also should identify your program's student learningobjectives and career/further education objectives, and summarize significant changes, achievements (byfaculty and students and the program itself), and plans for the future.

Section 6. Major Findings and Recommendations

These are the standard IBHE questions:

a. Description and assessment of any major changes in the program:

(1) changes in the overall discipline or field
(2) student demand
(3) societal needs
(4) institutional context for offering the degree
(5) other elements appropriate to the discipline in question

What, if any, internal or external events have affected your program since the last review? Have enrollments, degree production, costs, student satisfaction, job placement, etc. changed significantly? Has the discipline's governing body approved a new name for the programs it represents; updated/revised curricular requirements; identified new markets; developed new emphases? Have nationwide demographic changes or social policies affected enrollments or requirements for good or for ill?

In addition to the items included in the "Accountability" section of the VPAA website (see the left-hand navigation box at http://castle.eiu.edu/~acaffair/), the resources listed below may help you to respond toitem 6.a:

1. The IBHE Data Bank http://www.ibhe.state.il.us/Data%20Bank/default.htm includes the *Data Book*, which provides statewide discipline-based data on enrollments, degree production, and costs; as well as a variety of other data on statewide enrollments, degree production, credit hour production, and costs.

2. The Institutional Research web page available at https://www.eiu.edu/ir/ houses EIU's Data Books and the IBHE Alumni survey results, as well as a great deal of information about EIU students (ACT scores, degrees awarded, retention rates, etc.)

3. Occupational projections are available from many professional journals and organizations, as well as:

a. the Bureau of Labor Statistics http://stats.bls.gov/
b. ISBE's Educator Supply and Demand Report http://www.isbe.state.il.us/research/htmls/supply_and_demand.htm
c. the Illinois Workforce Information Center http://www.ides.illinois.gov/Pages/Workforce_Information_Center.aspx

4. Staff members in the Office of Institutional Research also are available to aid you in assembling and analyzing administrative data.

b. Description of major findings and recommendations, including evidence of learning outcomes and identification of opportunities for program improvement

While 6.b also asks you to discuss other significant findings, it is basically the assessment section of the program review. As such, the responses here are crucial to your review's success. Departments that cannot demonstrate that their assessment programs meet the established guidelines will be expected to revise those programs within six months of the final review deadline. The IBHE's **assessment guidelines are appended to this document.**

Since your overview already identifies your student learning objectives, focus here on the assessment program and its results. What measures are you using to assess learning? How well are students achieving the objectives identified for them? What are their specific strengths and weaknesses? What changes have you made and will you be making as a result of assessment? Emphasize direct assessment, but mention the indirect measures you are using as well. Support your generalizations with specific data/evidence. And be sure to include feedback from key stakeholders—students, alums, employers, peer reviewers, etc.—since the IBHE requires it.

c. Description of actions taken since the last review, including instructional resources and practices, and curricular

d. Description of actions to be taken as a result of this review, including instructional resources and practices, and curricular

6.c and 6.d are straightforward. However, by this point, you already may have mentioned the most significant actions your department has taken/is planning to take. Do not repeat yourself. Merely refer the reader to a previous section or sections.

Section 7. Outcome

After consultation with the College Dean, the Provost's Office will indicate whether the program will be deemed "in good standing" or "flagged for priority review." The latter category is used to identify programs experiencing serious concerns—significantly low enrollments, high costs, negative accreditation findings, below-average pass rates on statewide exams, below-average employment placement rates, a continuing lack of satisfaction among students or employers, etc. Departments will be asked to examine and address the identified concern(s) and report the results in an interim review, due in 1-3 years.Typically, however, the IBHE program review results in a positive decision, and the next review is due in eight years.