CALIFORNIA STATE UNIVERSITY EAST BAY

# ACADEMIC SENATE

## Committee on Academic Planning and Review

ANNUAL PROGRAM REPORT

| | |
|---|---|
| College | Science |
| Department | Engineering |
| Program | M.S. Engineering Management |
| Reporting for Academic Year | 2023-2024 |
| Last 5-Year Review | 2018 |
| Next 5-Year Review | **2028-2029** |
| Department Chair | Cristian Gaedicke |
| Date Submitted | 10/13/2025 |

## A. Five-Year Review Planning Goals

1. Curriculum Review: The Engineering Management curriculum underwent its scheduled five-year review during the 2024–2025 academic cycle.

2. Faculty: We have hired a new Assistant Professor, Dr. Christian Hernandez-Negron, in Industrial Engineering/Engineering Management for Fall 2025. This marks the first faculty hire in the program since 2004. Two Industrial Engineering professors—Dr. Bowen and Dr. Gajeizadeh—have fully retired, and two remaining full professors, Dr. Motavalli and Dr. Zong, are currently participating in the Faculty Early Retirement Program (FERP).

3. Research: Engineering Management faculty remain active in research, regularly publishing in peer-reviewed journals. Their strong industry connections provide students with opportunities to engage in real-world projects prior to graduation.

4. Laboratory Development: We have consistently secured A2E2 funding for laboratory development each year, allowing us to maintain up-to-date lab facilities.

5. Equipment: Thanks to annual A2E2 support and the regular computer refresh cycle managed by IT, our Engineering Management laboratories remain current. The Engineering computer lab was fully refreshed last year.

6. Enrollment: Enrollment in the Engineering Management program rose to 78 students in 2023 following the pandemic but declined to 50 in 2024. The program relies heavily on international students, many of whom have faced challenges entering the U.S. due to visa-related issues.

## B. Progress towards Five-Year Review Planning Goals

The MS in Engineering Management program was evaluated in 2024-2025 by Dr. Juan Ocampo as part of the 5 year review. The findings were generally positive and are summarized below:

**Program Strengths and Achievements**

1. **Post-Pandemic Enrollment Growth:** Student interest has rebounded strongly, signaling program relevance.
2. **Robust Assessment Plan:** Continuous evaluation ensures student learning outcomes are met and improved.
3. **Graduate Mentoring:** Personalized support for 78 students fosters academic and professional success.
4. **Distinct Regional Offering:** The MS in Engineering Management stands out in the Bay Area for its specialized curriculum and industry alignment.
5. **Career Outcomes:** Graduates find employment locally, with some pursuing opportunities out of state or doctoral studies.
6. **Faculty Resources:** One full-time and two part-time faculty provide a stable instructional foundation.
7. **Advisory Board:** Offers strategic guidance on curriculum and industry engagement.
8. **Well-Aligned PLOs:** Program Learning Outcomes match industry and academic standards.

**Recommendations and Areas for Improvement**

1. Alumni Feedback: Introduce exit and follow-up surveys to assess learning outcomes and career impact.
2. International Enrollment Support: Maintain strong institutional support for international recruitment and visa services, as 87% of students are international.
3. Tenure-Track Faculty Request: A dedicated faculty member would enhance curriculum leadership, mentoring, and industry partnerships.

4. Business School Collaboration: Cross-listed courses and joint initiatives could enrich interdisciplinary learning and expand industry connections.

Additionally, as part of the preparation for the recent five-year review, the previous study conducted in 2018 was analyzed. That review raised concerns about the prerequisite structure of the program:

*"The program currently requires a number of UG courses as pre-requisites for the MSEM program. Student will not get credit towards their graduate studies. It is recommended to combine these courses into one course and offer that at the graduate level. This may make the program more attractive to applicants."*

## C. Program Changes and Needs

**Overview:** The Engineering Management program launched in 2003 and experienced steady growth through 2016. However, challenges related to U.S. visa access for international students, followed by the COVID-19 pandemic, significantly impacted enrollment. Since 2021, enrollment has been on the rise, reaching 78 students in 2023—nearing an all-time high—before declining to 50 students in 2024.

The most recent five-year review by FDEC noted that while the program effectively serves international students, it does not yet fully meet the needs of our diverse local student population.

In response to recommendations from the last two five-year reviews and feedback from FDEC, we are proposing significant curriculum changes aimed at improving access for both domestic and international students.

**Curriculum:** We have proposed curriculum modifications to make the program more accessible to graduates from a variety of backgrounds—including STEM, business, and other disciplines. Specifically, we eliminated the program prerequisites and integrated key engineering principles—such as engineering statistics, probability, and engineering economics—directly into the core curriculum.

**Students:** These changes are designed to enhance the program's appeal, particularly for professionals currently working in the industry. We anticipate that this will increase interest and enrollment among domestic students in the Engineering Management graduate program.

**Faculty:** We recently hired Dr. Christian Hernandez-Negron, who will join the department in Fall 2025. Dr. Zong and Dr. Motavalli have entered the Faculty Early Retirement Program (FERP), with Dr. Motavalli currently serving as the program coordinator.

In addition to our tenure-track faculty, we have a dedicated team of lecturers with many years of industry experience. Their practical knowledge and ongoing professional engagement enrich the classroom experience and help bridge theory with real-world application.

**Staff:** We currently have one full-time Student Services Professional (SSP), Lisa Holmstrom, who plays a key role in student advising. Additional support is provided by the CS-Engineering Hub, which includes three full-time staff members. The School of Engineering also employs a technician, Linh Nguyen, who oversees laboratory maintenance, assists faculty with software and hardware issues, and manages the procurement of course supplies and equipment.

**Resources:** Laboratory resources are sufficient to support the successful delivery of the Engineering Management program.

**Assessment:** An extensive assessment process is in place for the Engineering Management program. Sample results are provided in the following section.

## I. SUMMARY of ASSESSMENT

### A. PROGRAM LEARNING OUTCOMES (PLOS)

| Students graduating with a M.S. in Engineering Management degree from Cal State East Bay will be able to: | | I.L.O Alignment |
|---|---|---|
| a | Develop advanced analytical skills in optimization, planning and control, and other quantitative management techniques. | 1, 6 |
| b | Effectively manage teams of multidisciplinary and multicultural professionals. | 3, 4 |
| c | Understand the impact of engineering and management decisions in a global, economic, environmental, and societal context. | 5 |
| d | Have the ability to effectively and persuasively communicate | 2 |
| e | Recognize the need for; and have an ability to engage in, life-long learning. | 2, 6 |

### B. Program Learning Outcome(s) Assessed:

| ▪ Year 2: 2024-2025 ▪ | |
|---|---|
| 1. *Which PLO(s) to assess* | PLO b - Effectively manage teams of multi-disciplinary and multi-cultural professionals. (ILO 3,4) |
| 2. *Is it aligned with ILO?* | Yes, (ILO 3,4) |
| 3. *Course name and number* | ENGR 670 Design and Management of Human Work Systems |
| 4. *SLO from the course* | Ability to apply learned concepts and tools to improve organizational performance in novel situations. Understand the function and management of professionally and culturally diverse teams. Ability to communicate convincingly in writing and orally regarding the efficacy of a particular course of action, supported by description and application of relevant theory. |

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|---|---|
| *5. Assessment activity* | Class project and exams |
| *6. Assessment Instrument* | Department rubric |
| *7. Time (which semester(s))* | Spring 2020 |
| *8. Strategies on reporting (how, to who)* | The results (quantitative and qualitative) will be reported by faculty to the department chair via completion of the course Faculty Self-Assessment form. |
| *9. Strategies on closing the loop* | Interaction between chair, faculty and industrial advisory board |
| *10. Responsible person(s)* | Prof. Vatan |

**Course Assessment Report**

**Instructor:** Dr. Sahika Vatan

**Course:** ENGR 670 – Design and Management of Human Work Systems
**Term:** Spring 2025

**Enrollment:** 47

**Program Learning Outcome (PLO):**

**PLO b – Effectively manage teams of multi-disciplinary and multi-cultural professionals.**
*(Aligned with Institutional Learning Outcomes 3 – Collaboration and 4 – Diversity & Global Citizenship)*

**Course Summary**

ENGR 670 focuses on the design and management of efficient and effective human work systems that enhance productivity, safety, and organizational well-being.
The course integrates process management, methods analysis, work measurement, and behavioral aspects of engineering organizations.
Students develop both technical and interpersonal competencies needed to analyze, improve, and lead work systems composed of diverse professionals.

The **primary course-level outcomes** that align with **PLO b** are:

Ability to apply learned concepts and tools to improve organizational performance in novel situations. Understand the function and management of professionally and culturally diverse teams. Ability to communicate convincingly in writing and orally regarding the efficacy of a particular course of action, supported by description and application of relevant theory.

**C. Summary of Assessment Results**

**Summary of Student Course Performance**

The **main assessment tool** for PLO b was the **Work System Improvement Project**, completed in student teams.

Each group conducted a real analysis of a human work system, applied time and motion study techniques, and proposed redesigns that improved efficiency, safety, and employee well-being. Teams presented their results in written reports and oral presentations.

**Assessment criteria** included:

- Effective collaboration and role distribution within diverse teams
- Integration of multiple perspectives and technical disciplines
- Professional communication of findings (both oral and written)
- Application of data analysis and ergonomic design principles

**Results**

- **95% of students** scored **90% or higher** on teamwork and collaboration dimensions in the project rubric.
- Peer evaluations and instructor observations confirmed that students demonstrated strong collaboration and professional communication skills.
- Teams effectively integrated diverse perspectives into their system redesign proposals, indicating high achievement of **PLO b** and **ILOs 3 and 4**.

**Student Comments**

Student feedback was positive and emphasized the value of:

- Working in multidisciplinary teams that mirrored real-world industrial engineering environments.
- The practical nature of workshops and case studies.
- Opportunities to apply both technical and behavioral concepts to human-centered design problems.

**Summary of Faculty Experience and Observations**

Students showed high engagement and motivation, especially during collaborative workshops and team projects. The diversity of student backgrounds (industrial, mechanical, and computer engineering) enriched discussions and project creativity. Faculty observed strong peer learning and effective communication within teams. Future iterations could benefit from incorporating more structured peer feedback and explicit discussion of cross-cultural communication dynamics.

**Summary of Achievement of Course Outcomes**

Overall, **ENGR 670 met its learning outcomes successfully**. Students demonstrated proficiency in:

- Managing teamwork and interdisciplinary collaboration (PLO b, ILO 3).

- Recognizing and incorporating cultural and human factors in system design (PLO b, ILO 4).
- Communicating engineering decisions and recommendations effectively.

Evidence from project scores, peer evaluations, and qualitative feedback confirms that this course meaningfully advances students' ability to manage diverse professional teams.

**Recommended Changes / Continuous Improvement**

1. **Enhance cross-cultural communication components:**
    a. Add a short reading or discussion module on managing multicultural and distributed teams.
2. **Increase formative feedback opportunities:**
    a. Introduce structured peer evaluations midway through the project to identify and resolve teamwork issues early.
3. **Expand case study library:**
    a. Include more global case studies to reinforce diversity and cultural competency themes.
4. **Integrate reflection assignment:**
    a. Add a brief individual reflection on teamwork and leadership challenges to promote self-awareness and accountability

**D. Assessment Plans for Next Year**

| ▪ **Year 3: 2025-2026** ▪ | |
|---|---|
| 1. *Which PLO(s) to assess* | PLO c - Understand the impact of engineering and management decisions in a global, economic, environmental, and societal context (ILO 5) |
| 2. *Is it aligned to an ILO?* | Yes, ILO 5 |
| 3. *Course name and number* | ENGR 660 Sustainable Product and Process Design |
| 4. *SLO from Course* | Student Learning Outcomes:<br>Convincingly argue the merits and strategic importance of new product design and development for attaining competitive advantage. Apply Function-means analysis techniques and Functional mapping techniques.<br>Understand and apply Life Cycle Analysis to improve sustainability of a product's design, manufacture, operation and disposition after primary intended use.<br>Utilize taught techniques and tools in a team environment to design sustainable products and processes, and to communicate design results orally and in writing. |
| 5. *Assessment activity* | Midterm performance on related question |
| 6. *Assessment instrument* | Department rubric |
| 7. *Responsible person(s)* | Prof. Bowen |

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|---|---|
| 8. *Strategies on reporting (how, to who)* | The results (quantitative and qualitative) will be reported by faculty to the department chair via completion of the course Faculty Self-Assessment form. |
| 9. *Strategies on closing the loop* | Interaction between chair, faculty and industrial advisory board |
| 10. *Time (which semester(s))* | Spring 2021 |

## III. DISCUSSION OF PROGRAM DATA & RESOURCE REQUESTS

*Discussion of Trends & Reflections*

The following table presents enrollment data extracted from the Pioneer Data Warehouse. As shown in Figure 1, enrollment in the Engineering Management program increased between 2021 and 2023, reaching a peak of 78 students. However, enrollment declined to 50 students in 2024.

To reduce reliance on international enrollment—which is highly sensitive to political and economic factors beyond our control—we plan to increase outreach and advertising to the local student population.

In an effort to diversify our student body and expand career advancement opportunities for the Bay Area's diverse communities, we have significantly revised the curriculum. These changes are designed to make the program more accessible and appealing to students from a wide range of academic backgrounds—not just those with engineering degrees.

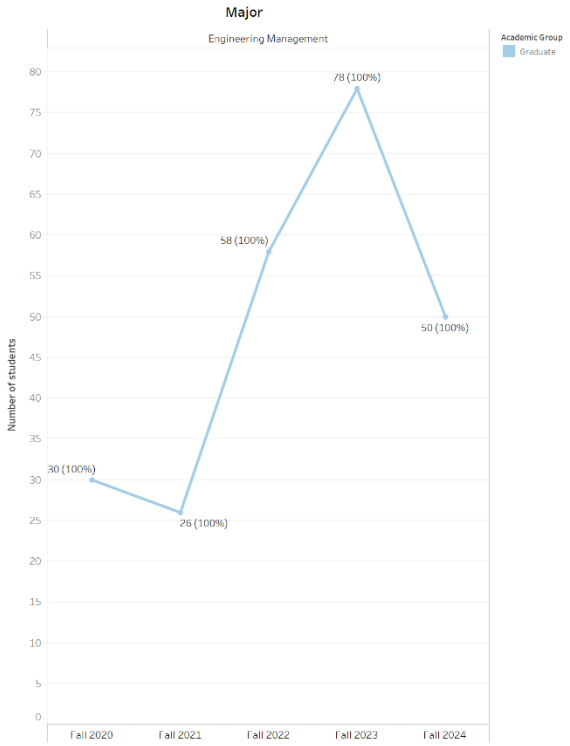


Figure 1 Five years enrollment trend.

*Enrollment Profile*

The majority of students in the program are international (98%), which is not uncommon for graduate engineering programs. However, we are committed to increasing domestic student enrollment to strengthen program diversity and long-term stability.

**Reflections on Trends and Program Statistics:**

We believe enrollment in the Engineering Management program has strong potential for rapid growth, driven by our revised curriculum and the elimination of engineering prerequisites.

**Request for Resources*:*** We have successfully upgraded both the Manufacturing Laboratory and the Engineering Computer Lab, ensuring students have access to modern, well-equipped facilities.

**Request for Tenure-Track Hires:** We recently hired a new Assistant Professor in Industrial Engineering/ Engineering Management, who will begin in Fall 2025. However, we experienced the retirement of two full professors in 2024. To maintain program quality and continuity, we request the addition of a tenure-track faculty member within the next two academic years. This position would support both the M.S. in Engineering Management and the B.S. in Industrial Engineering programs.

**Request for Other Resources:**

Currently, we have the equivalent of two full-time faculty in Engineering Management—one new tenure-track hire and two senior faculty serving part-time through the Faculty Early Retirement Program (FERP). While we continue to hire experienced industry professionals as instructors to help meet instructional needs, we lack sufficient support for service-related activities. Allocating resources to hire hourly student assistants would greatly benefit existing faculty by helping manage essential service tasks and improving overall program operations.