

## Annual Program Report, MS Engineering Management

College	Science
Department	Engineering
Program	M.S. Engineering Management
Reporting for Academic Year	2022-2023
Last 5-Year Review	2018
Next 5-Year Review	2023-2024
Department Chair	Farnaz Ganjeizadeh
Date Submitted	10/01/2023

### I. SELF-STUDY

#### A. Five-Year Review Planning Goals

1. Because of the Covid pandemic, the enrollment in this program has been in decline. However, for the Fall of 2023 the enrollment has increased to an all time high of 78 students as shown in Table 1.
2. Faculty: The faculty that support this program are also supporting the Industrial Engineering program. The faculty are; Helen Zong, Farnaz Ganjeizadeh and David Bowen. Helen Zong has started her early retirement term this year. We have not hired any faculty for this program since 2004. To keep the program up-to-date and increase the research output of the faculty, we plan to request an additional TT line for next year.
3. Research: The faculty are publishing regularly and supervise MS projects.
4. Equipment: Through A2E2 annual funding and the normal refresh cycle of computers by IT, we are keeping the Engineering Management Laboratories current. The computers in the engineering laboratory have been upgraded last year. Enrollment: Student enrollment in the Engineering Management program has been declining for the past couple of years. The engineering management program relies heavily on international students who have had

difficulty entering the U.S. The Pandemic has exacerbated this problem. We have seen a substantial increase for Fall 2022.

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

1. Updated the laboratory equipment
2. Increased enrollment to all time high
3. Asking for a faculty position for next year

### **C. Program Changes and Needs**

**Overview:** The Engineering Management program started in the year 2003 and was steadily growing until 2016. The problems with acquiring U.S. visa for international students and then the pandemic had a significant impact on the enrollment in the program. Starting 2021, the enrollment has been on the increase and now has reached 78 students that is close to an all time high.

**Curriculum:** Since the Fall semester of 21 all courses have returned to on ground instruction.

**Students:** Demand for domestic Engineering Management graduates is not strong.

**Faculty:** Since 2004, we have had three faculty dedicated to the Engineering Management and the Industrial Engineering programs. The faculty include Drs. Helen Zong, David Bowen and Farnaz Ganjeizadeh. Dr. Zong has entered the early retirement program.

**Staff:** We currently have one full time SSP (Lisa Holmstrom) who is heavily involved in student advising. We are also supported by the CS-Engineering hub that includes three full time personnel. The school of Engineering also has a technician (Linh Nguyen) that is in charge of laboratory upkeep, assisting faculty with their software and hardware problems and ordering course supplies and other hardware or software needs.

**Resources:** The laboratory resources are sufficient for the offering of this 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:**

1. <i>Which PLO(s) to assess</i>	PLO e - Recognize the need for, and have an ability to engage in, life-long learning (ILO 2,6)
2. <i>Is it aligned to an ILO?</i>	Yes, ILO 2, 6
3. <i>Assessment activity</i>	Capstone project
4. <i>Assessment instrument</i>	Department rubric
5. <i>Sample (courses/# of students)</i>	ENGR 693A Applied Research in Engineering Management
6. <i>SLO from the course</i>	Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. Ability to communicate engineering management concepts and results orally and in writing.
7. <i>Time (which semester(s))</i>	Spring 2023
8. <i>Responsible person(s)</i>	Prof. Motavalli
9. <i>Strategies on reporting (how, to who)</i>	The results (quantitative and qualitative) will be reported by faculty to the department chair through course self assessment form
10. <i>Strategies on closing the loop</i>	Interaction between chair, faculty and industrial advisory board

### C. Summary of Assessment Results

Summary: In this course students work on MS projects in teams. The course requires an extensive literature search and identification of original and impactful topics to work on. The team presents several reports including a proposal and progress reports. They also deliver a final report and a final presentation. The reports and the presentations are evaluated using the following rubric. Alumni have evaluated the course material as valuable in their professional career. The performance indicators for assessment of this outcome and the rubric used are as follows. The rubric that is used to evaluate the projects is as follows:

Project topic originality	5%
Methodology	8%
Application	5%
Written report	20%

Team Presentation	20%
Team member evaluation	5%
Peer evaluation	2%
Clarity of Presentation	10%
Presentation material	10%
Team transactions	5%
Individual presentation ability	10%

According to this rubric around 35% of the grade is related to originality and methodology of the research that can evaluate students' ability to acquire new knowledge. For the 15 students (5 teams) who participated in this evaluation, the average percentage for the portion of the rubric related to research was 75% with the lowest grade of 70% and the highest of 90%. The majority of students achieved the communications skills outcome.

#### D. Assessment Plans for Next Year

▪ Year 4: 2023-2024	
1. Which PLO(s) to assess	PLO a - Develop advanced analytical skills in optimization, planning and control and other quantitative management techniques (ILO 1, 6)
2. Is it aligned to an ILO?	Yes (ILO 1, 6)
3. Course name and number	INDE 520 System Modeling with Simulation
4. SLO from course	Use queuing theory to measure system performance and to design systems -Conduct simulation studies for system design and performance measurements -Interpret simulation results and recommend system improvements
5. Assessment activity	Queuing midterm exam question
6. Assessment Instrument	Department rubric
7. Responsible person(s)	Prof. Zong
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.

### III. DISCUSSION OF PROGRAM DATA & RESOURCE REQUESTS

#### Discussion of Trends & Reflections

The following table is enrollment data extracted from Pioneer Data Warehouse. As the data indicates the Engineering Management enrollment has been in a downturn trend for the past three years. From the high of 87 in 2015 to low of 25 in the Fall of 2019 in Fall 2020 we have seen an uptick in enrollment. The pandemic and the difficulty of acquiring U.S. visas for international students have been a major factor in this trend. As seen in Figure 2, the enrollment is recovering. It currently stands at 78 students. We plan to increase our advertising to the local student population in order to reduce the reliance on international students. The three faculty that serve this program are also responsible for the industrial engineering program. We have not hired any TT faculty since 2004.

Figure 1 Five years enrollment trend.

Displaying: N - Res. & Non-res., FallHeadcount

College	AcademicO.	Plan	EnrollmentGroup	2018	2019	2020	2021	2022	2023
CSCI	252 - ENGR	Engineering	New Grad/PBAC	10.00	8.00	9.00	11.00	28.00	26.00
		Management MS	Cont. Grad/PBAC	30.00	17.00	21.00	15.00	30.00	52.00
		Total		40.00	25.00	30.00	26.00	58.00	78.00

#### *Enrollment Profile*

The program has a high percentage of female students. As of Fall 2023 the percentage of female students is around 40%. The majority of the students in the program are international (90%). This is not very unusual for graduate engineering programs.

#### Notable Trends:

1. Recovering enrollment
2. Industry demand for the graduates
3. Reliance on international students
4. Active Advisory Board Council

**Reflections on Trends and Program Statistics:**

We believe the enrollment in the program will increase to about 90 students within the next three years.

**Request for Resources****1. Request for Tenure-Track Hires:**

We have not hired any faculty in Industrial Engineering or Engineering Management since 2004. All faculty are full time professors (one FERP). These programs require the addition of a new tenure-track faculty to stay current.

**2. Request for Other Resources**

N/A