



ANNUAL PROGRAM REPORT

College	Science
Department	Engineering
Program	B.S. Industrial Engineering
Reporting for Academic Year	2017-2018
Last 5-Year Review	09/2016
Next 5-Year Review	
Department Chair	Saeid Motavalli
Date Submitted	9/14/2017

SELF-STUDY (suggested length of 1-3 pages)

A. Five-Year Review Planning Goals

- 1. The major change will be the transfer to a semester-based program. The Industrial Engineering curriculum has been transformed in such a way that it both satisfies the accreditation requirements and will produce technically stronger graduates. This has been accomplished by fundamental changes to courses, teaching methods and course requirements.*
- 2. Faculty: As mentioned in accreditation review report following the 2015 visit, we have to address their observation that the program needs additional faculty before the next visit.*
- 3. Research: The Industrial Engineering faculty are active in research and are being successful in securing funds for their research. The faculty plan is to aggressively pursue funding opportunities, specifically in areas related to the advancement of engineering education.*
- 4. Laboratory Development: Room SCS 247, Materials Testing Laboratory, is being remodeled to a lab-lecture room with a capacity of 36. Flexible furniture suitable for active learning practices have been installed.*
- 5. Equipment: Through A2E2 annual funding and the normal refresh cycle of computers by IT we are keeping the Industrial Engineering Laboratories current. There is a need for new equipment in the area of automation in manufacturing.*
- 6. Enrollment: Student enrollment in Industrial Engineering program has remained steady in recent years.*
- 7. Excess credits: The program requires 192 credit hours to complete. The exemption for Engineering has been approved by the University and allowed by the Chancellor's Office. We have kept the program requirements at the minimum level required for accreditation.*

B. Progress Towards Five-Year Review Planning Goals

- 1. Successfully transformed the curriculum to a semester-based program.*
- 2. We are planning to request one tenure track position for the industrial engineering program as suggested in the findings of our last accreditation visit report.*

3. *The remodeling of materials lab SSC 247 has been completed and it is used as lab/active learning classroom.*
4. *Enrollment in industrial engineering has remained steady as indicated by University data.*
5. *The program credit requirement is in line with the quarter system and is being-finalized during the catalog review.*

#### **B. Program Changes and Needs**

*Report on changes and emerging needs not already discussed above. Include any changes related to SBI440, significant events that have occurred or are imminent, program demand projections, notable changes in resources, retirements/new hires, curricular changes, honors received, etc., and their implications for attaining program goals. Organize your discussion using the following subheadings.*

*Overview: The industrial engineering program started in the year 2000 and has been steadily growing with the enrollment stabilizing in the past three years. Since 2004 we have not hired any faculty for this program. Our last accreditation review was conducted in the Fall quarter of 2015. Their findings included the fact that the program needs new faculty members to stay current. We are planning to request a faculty position for this program in this academic year.*

*Curriculum: The transformed curriculum is design to include more active learning practices and includes courses and material that are in line with the employment trends for industrial engineers.*

*Students: Demand for industrial engineering graduates are relatively strong. Most of our graduates are employed in engineering positions mainly in the Bay Area.*

*Faculty: Since 2004 we have had 3 faculty dedicated to the industrial engineering program and M.S. in engineering management. These include Drs. Helen Zong, David Bowen and Farnaz Ganjiezadeh. The program needs one additional tenure-track position*

*Staff: We have one full time staff for the School of Engineering, Mrs. Paula Trujillo and a laboratory technician, Mr. Brandon Xia.*

*Resources: We have to upgrade our Manufacturing processes equipment. We plan to develop a proposal to submit to the College of Science that would include equipment such as table top machine tools and small robotic arms.*

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

#### **SUMMARY OF ASSESSMENT** *(suggested length of 1-2 pages)*

##### **Program Learning Outcomes (PLO)**

1. *Ability to apply knowledge of mathematics, science, and engineering.*
2. *Ability to design and conduct experiments, as well as to analyze and interpret data.*

3. 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.
4. Ability to function on multidisciplinary teams.
5. Ability to identify, formulate and solve engineering problems.
6. Understanding of professional and ethical responsibility.
7. Ability to communicate effectively.
8. Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
9. Recognition of the need for, and an ability to engage in, life-long learning.
10. Knowledge of contemporary issues.
11. Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. ILO to PLO mapping is shown below:

ILO	THINK CRITICALLY AND CREATIVELY AND APPLY ANALYTICAL AND QUANTITATIVE REASONING TO ADDRESS COMPLEX CHALLENGES AND EVERYDAY PROBLEMS	COMMUNICATE IDEAS, PERSPECTIVES, AND VALUES CLEARLY AND PERSUASIVELY WHILE LISTENING OPENLY TO OTHERS	APPLY KNOWLEDGE OF DIVERSITY AND MULTICULTURAL COMPETENCIES TO PROMOTE EQUITY AND SOCIAL JUSTICE IN OUR COMMUNITIES	WORK COLLABORATIVELY AND RESPECTFULLY AS MEMBERS AND LEADERS OF DIVERSE TEAMS AND COMMUNITIES	ACT RESPONSIBLY AND SUSTAINABLY AT LOCAL, NATIONAL, AND GLOBAL LEVELS	DEMONSTRATE EXPERTISE AND INTEGRATION OF IDEAS, METHODS, THEORY AND PRACTICE IN A SPECIALIZED DISCIPLINE OF STUDY
I.E. B.S. PLO	2,3,9,10	7	8	4	6	1,5,11,

**Program Learning Outcome(S) Assessed**

List the PLO(s) assessed. Provide a brief background on your program's history of assessing the PLO(s) (e.g., annually, first time, part of other assessments, etc.)

We have assessed the following PLOs for the Industrial Engineering program during the 2016-17 Academic Year:

2016-2017	
1. Which PLO(s) to assess	<p><b>PLO 5 an ability to identify, formulate, and solve engineering problems</b> This outcome was assessed in INDE 4100, Production Planning and Control by Dr. Ganjeizadeh Winter of 2017</p> <p><b>PLO 10 - a knowledge of contemporary issues in Engineering</b> This PLO was assessed by Dr. Bowen in ENGR 4610 Senior Design, Winter of 2017</p>

Summary of Assessment Process:

**Assessment of PLO (5)**

*Class project reports and exams are used to assess this outcome.*

*Summary: This course (INDE 4100) involves hands on as well as application of theory in solving engineering problems. The course includes hands on lab activities. 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.*

<b>Analyzing and Solving Engineering Problems</b>	Minimal analysis was performed.	Analysis tools were used but incorrectly applied or interpreted.	Analysis was performed, but opportunities for increased insight were missed.	The problem and information were effectively analyzed using multiple engineering analysis tools.
	1	2	3	4

*The average over all measurement tools was 4.00, which is considered as achieving the outcome.*

**Assessment of PLO (10)**

*Capstone project that included globalization group activity and discussion is used to assess this outcome. This outcome is assessed considering the following performance indicators*

*Ability to understand globalization and cultural differences as it relates to working in their project groups and with their project clients at practice level.*

*Globalization group activity (P/NP).*

*Oral presentation and final written report (Faculty assessment according to rubric)*

*Sampling Procedure: All student reports and projects are assessed. Data is collected every quarter the*

<b>Ability to apply production planning techniques in real life scenarios via case studies</b>	Formulate and solve a production planning problem in teams	Demonstrate understanding of production planning applications (team presentation evaluated by faculty and peers)	Formulate and solve complex final project real life scenario -final team project
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*course is taught.*

*Summary of Assessment Results*

*Summarize your assessment results briefly using the following sub-headings.*

*Main Findings: Senior project reports did not specifically addressed the use of realistic constraints as indicated by our accreditation team. We have since required student teams to specifically emphasis several realistic constraints they addressed in their reports. These include economic, social, ethical, sustainability and other constraints. These changes were reported to our accreditation agency in June 2016. The revised rubric and project requirements have been used last Spring quarter for the first time and will be used every year to evaluate senior design projects.*

**Assessment Plans for Next Year**

*Summarize your assessment plans for the next year, including the PLO(s) you plan to assess, any revisions to the program assessment plan presented in your last five-year plan self-study, and any other relevant information.*

*We will assess the following PLO's in this academic year.*

12. *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.*
8. *Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.*
11. *Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice*

### DISCUSSION OF PROGRAM DATA & RESOURCE REQUESTS

*Each program should provide a one-page discussion of the program data available through CAPR. This discussion should include an analysis of trends and areas of concern. Programs should also include in this discussion requests for additional resources including space and tenure-track hires. Resource requests must be supported by reference to CAPR data only. Requests for tenure-track hires should indicate the area and rank that the program is requesting to hire. If a program is not requesting resources in that year, indicate that no resources are requested.*

#### Discussion of Trends & Reflections

##### Notable Trends:

*Summarize and discuss any notable trends occurring in your program over the past 3-5 years based on program statistics (1-2 paragraphs). You may include 1-2 pages of supplemental information as appendices to this report (e.g., graphs and tables).*

*The enrollment in this program has remained steady over the past 3 to 5 years.*

##### Reflections on Trends and Program Statistics:

*Provide your reflections on the trends discussed above and statistics and supplemental information presented in this report.*

*Request for Resources: The equipment for the manufacturing automation and processes courses are extremely out of date such that none of the software that controls the machines works with the new Windows computers. We are planning to submit a proposal to the College of Science for acquisition of table-top machine tools and small robots. These are essential equipment for the viability of the program.*

*Request for Tenure-Track Hires: We are requesting an additional tenure-track faculty position this year. This faculty would support industrial engineering and engineering management programs.*

#### Request for Other Resources