Masters of Engineering Management

Annual Program Report Template

Year:	2022-2023
Program:	Masters of Engineering Management
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Summary of Continuous Improvement Efforts since Last Report

Provide a brief description of how assessment results have been used for program improvement. Point to a specific example of how an assessment provided the program with data it could use for improvement and what that improvement was, if possible, also show evidence of the improvement. You may look at data from the two previous academic years to support this case.

Respond here:

1. INEN 5380 Project Management (Required Course)

Identification: INEN 5380 "Project Management" is a mandatory course for MEM program and elective course for other graduate students. Instructor realized that students need more interaction even though the course listed as an online course.

Improvement: Instructor created more live sessions to increase interactions for the class during nighttime since many of the students had full time jobs. The focus was more on use of theory behind MS Project and use of MS project. Attendance was not mandatory for these sessions, but the sessions were recorded via collaborate ultra. In this case, students can watch the live sessions.

Result of Improvement: Feedback from the students were great, they liked the live sessions and even they stated that they would like to have more live sessions in their course evaluations.

2. INEN 5380 Project Management (Required Course)

Identification: INEN 5380 "Project Management" is a mandatory course for MEM program and elective course for other graduate students. The instructor realized that students had struggle on the solution of the problems in homework assignments. Instructor realized that explanation of issues with recorded videos and live session would be good.

Improvement: Instructor developed some videos explaining more examples for the preparation of HW and Project. Instructor created some live sessions to explain MS Project software as well. Attendance was not mandatory for this session, but the sessions were recorded via collaborate ultra. In this case, students can watch the live session videos and do not miss the opportunity to learn from the live sessions.

Result of Improvement: Homework and project quality were significantly improved.

3. Contest in Technology Entrepreneurship

Identification: The instructor developed the Technology Entrepreneurship course to provide engineering students with knowledge about how technology-based startup companies are founded and grow. The course was originally developed in collaboration with the Center for Innovation Commercialization and Entrepreneurship (CICE), and was intended to be a starting point for students to become engaged in CICE events and activities. Unfortunately, due primarily to COVID, most activities never came about and CICE was recently restructured and brought under the new Entrepreneurship Institute at LU. There was a need to work with the new executive director and other stakeholders to connect the course into the Entrepreneurship Institute ecosystem.

Improvement: Through a series of meetings over Summer of 2022 the instructor, along with collaborators at the Entrepreneurship Institute and community stakeholders, developed a plan to coordinate course activities with events such as the Entrepreneurship Institute speaker series and, most importantly, the new Cardinal Ideas Pitch Deck Competition.

Result: Students taking the course worked in small teams to develop an initial idea into a product design, and then into a business model. The pitch deck competition was timed to correspond with the point in the course when students were making their pitch decks, in this way all the teams could apply to enter the competition. Teams who were not accepted were still allowed to give practice talks, while those who were accepted competed for $10,000 in prizes! Students not only learned abut entrepreneurship, but also learned about the resources and connections available to them through the Entrepreneurship Institute, and they will be invited to future events such as an entrepreneurship bootcamp and an entrepreneurship field trip planned for spring 2023.

4. INEN 5358 Intro to Robotics

Identification: Applications of robotic automation have become increasingly important in manufacturing, warehouse, and other industrial and service sectors. INEN 5358 Intro to Robotics was in the course inventory but was not offered for at least 10 years.

Improvement: The instructor decided to develop the course with modern approach. It was first developed in Summer 2021, then offered again in 2022. We used the textbook "Modern robotics: Mechanics, Planning, and Control" by Kevin M. Lynch and Frank C. Park, Cambridge University Press, 2017. The CoppeliaSim robot simulation environment (formerly known as V-REP) was used to experiment with the kinematics of different robots and to animate solutions to inverse kinematics, dynamics simulations, and controllers. It is free for educational use and cross platform. Two simulation workshops, one on forward kinematics, one on inverse kinematics were developed to allow student to better understand the algorithms.

Results of improvement: The course received very good student evaluation (4.40 in 2021 and 4.43 in 2022) with response rate of 11/12 = 92% and 21/21=100% in 2021 and 2022 respectively.

Program Highlights Since Last Report

Identify and briefly discuss any programmatic curriculum changes made since the last report (e.g. new courses, course changes, SLO changes, course deletions).

Respond here:

Several new graduate courses were taught:

1. ST: User Interface – A new course in JavaScript for teaching development of user interface for engineering applications.
2. ST: Additive Manufacturing – An introduction to additive manufacturing using a new lab and new equipment.
3. Technology Entrepreneurship with pitch deck contest with 10000 prize added as a new learning activity.
4. INEN 5358 Robotics taught for the first time in 10 years.

Table 1. Assessment Results and Analyses for Current Cycle.

STAGE 1: PLAN				STAGE 2: DO		STAGE 3: STUDY
Departmental Student Learning Goal	Program Student Learning Outcome	Assessment	Assessment Method/Location	Benchmark Expectations	Data Results	Actions/Goals Based on Data Results* What do the data tell you? How will you use this data? How were data from the last cycle used to make changes

					during this cycle, and What were the results of those changes?
Engineering Management Specialized Knowledge	1 . Understanding of Engineering Management	Student work in INEN 4315 (final report)	Review of Work by faculty who do not teach the course / Online	Rate on Likert scale 4- Good, 3 - Average, 2 - Marginal, 1 - Unacceptable At least 60% of students must be in the good and average ranking. At least 80% of students must be in the good, average, marginal rankings.	Average = 3.8 Marginal and Unacceptable = 0% Unacceptable = 0%	Above standard. No specific action.
Engineering Management Specialized Knowledge	2. Ability to Apply Engineering Management to a business problem	Same as above	Same as above	Same as above	Average = 3.8 Marginal and Unacceptable = 0% Unacceptable = 0%	Above standard. No specific action.
Engineering Management Specialized Knowledge	3. Analyzing factors beyond cost including public health, safety, and welfare, as well as global, cultural, social, and environmental.	Same as above	Same as above	Same as above	Average = 3.8 Marginal and Unacceptable = 0% Unacceptable = 0%	Above standard. No specific action.
Written, oral and graphical communication	1. Grammar	Same as above	Same as above	Same as above	Average = 3.5 Marginal and Unacceptable = 0% Unacceptable = 0%	Above standard. Several course level improvements have been directed to student writing.
Written, oral and graphical communication	2. Document Organization	Same as above	Same as above	Same as above	Average = 3.7 Marginal and Unacceptable =	Above standard. Several course level improvements

					0% Unacceptable = 0%	have been directed to student writing.
Written, oral and graphical communication	3. Conclusion / Summary of Information	Same as above	Same as above	Same as above	Average = 3.7 Marginal and Unacceptable = 0% Unacceptable = 0%	Above standard. Several course level improvements have been directed to student writing.
Written, oral and graphical communication	4. Effective use of pictures, graphs and tables	Same as above	Same as above	Same as above	Average = 3.3 Marginal and Unacceptable = 20% Unacceptable = 10%	Above standard. Several course level improvements have been directed to student writing.
Written, oral and graphical communication	5. References	Same as above	Same as above	Same as above	Average = 3.9 Marginal and Unacceptable = 0% Unacceptable = 0%	Above standard. Several course level improvements have been directed to student writing.
Analyze and interpret data, and use engineering judgment to draw conclusions	1. Selecting the correct engineering management approach for a problem.	Same as above	Same as above	Same as above	Average = 3.8 Marginal and Unacceptable = 0% Unacceptable = 0%	Above standard. No specific action.
Analyze and interpret data, and use engineering judgment to draw conclusions	2. Defining environments where an engineering management approach would and would not be effective.	Same as above	Same as above	Same as above	Average = 3.9 Marginal and Unacceptable = 0% Unacceptable = 0%	Above standard. No specific action.

Table 2. Continuous Improvement Results Since Last Report

Stage 4: ACT		
Actions/Goals Based on Data Results *Copy last cycle's actions/goals and report on progress toward continuous improvement on those here.*	**Status** C=Complete P=Progressing N=No Action Taken	**Discussion of Status** *If C, describe efforts that led to accomplishment of actions/goals.*

		If P, provide update on progress made toward accomplishing actions/goals and what tasks remain *If N, discuss why action toward accomplishing actions/goals has been delayed and what work will be initiated toward accomplishment.*
Required faculty to document improvements in annual performance review (F2.08) under teaching section. For year 1, I asked all faculty to go 4 years back. In future years, new improvements plus tracking results of existing improvements will be included. The improvements are used a significant part of the annual evaluation (teaching section is 50% for most faculty).	C	Documented 30 pages of course level improvements. These improvements are shared among the faculty to share best practices and understand updates in courses at the instructor level.
Identify a replacement for business school courses that are capacity constrained (SAP and other). The lack of visibility in space for MEM in COB students is a major issue that must be resolved.	P	We are developing some alterative courses for our students. Unfortunately, they are not a direct replacement for the SAP course due to our faculty being unable to teach SAP effectively (not SAP experts). Solving this lack of business school courses is a major challenge for the department.