Doctor of Engineering

Annual Program Report

Year:	2022 (Submitted in March 2023)
Program:	Doctor of Engineering
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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:

The following improvements have been implemented to the Doctor of Engineering (DE) program.

1. New courses have been developed and added to the program. Approximately ten new DE 6000-level course additions have been implemented. This effort is to improve all four student learning outcomes.
2. The DE courses syllabi have been reviewed and revised to increase the academic rigor of the program. This work is an ongoing project starting in summer 2022.
3. The DE degree plan has been revised. The revision was approved by the Graduate Council. The new plan describes and defines in detail the required courses, contents and format of the examinations, and timeline.
4. The College of Engineering is increasingly holding seminars in various fields of study, which all DE students are encouraged to attend.
5. ENGR 6110 Professional Seminar course has been improved to include contents of detailed research process, degree progression, dissertation writing and research presentation. ENGR 6110 is a required course for all the DE students. This work aims to address Outcomes 1, 2, and 3.

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:

1. The new degree plan has revised the content of the qualifying exam and candidacy exam. The change was approved by the Graduate Council.
2. Course addition list:
    1) CHEN 6333 Nanotechnology for Sensors
    2) CHEN 6340 Distillation
    3) CHEN 6341 Mass Transfer Operation

4) CHEN 6344 Multimedia Transport Pollutant
5) CHEN 6346 Sustainability Applications
6) CHEN 6363 Process Modeling w/ Neural Network
7) ELEN 6303 Python Programming
8) INEN 6305 Engineering Reliability
9) MEEN 6312 Advanced Topics on Fluid Mechanics
10) MEEN 6332 Advanced Topics in Computational Fluids
11) MEEN 6315 Advanced Engineering Mathematics

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?
Outcome #1*: An ability to apply the knowledge of mathematics, sciences, and engineering to solve scientific and engineering problems of complex natures.*	Criterion #1 Math and Engineering Reasoning	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.4	Meet the expectation. Approximately 10 new DE 6000-level courses have been added. There will be continued work on adding engineering math and science courses.
Outcome #1	Criterion #2 Terminology and Notation	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.7	Meet the expectation. This criterion is an improvement over that of the previous report. The ENGR 6110 Professional Seminar course added content on how

						to write a dissertation, including terminology and notation.
Outcome #1	Criterion #3 Strategy/Procedures	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.8	Meet the expectation
Outcome #1					3.6	Met the target
Outcome #2*: An understanding of multiple constraints of engineering problems and contemporary issues in engineering development.*	Criterion #1 Amount of Information	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.6	Meet the expectation.
Outcome #2	Criterion #2 Quality of Information	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.4	Meet the expectation
Outcome #2	Criterion #3 Literature Survey	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.8	Meet the expectation. This criterion is an improvement over that of the previous report. The ENGR 6110 Professional Seminar course added a course module on research process, including the literature review.
Outcome #2	Criterion #4 Understanding of contemporary problems	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.4	Meet the expectations. An improvement over the previous cycle. The College of Engineering is increasingly running wide-

						ranging research seminars, which all DE students are encouraged to attend.
Outcome #2					3.5	Met the target
Outcome #3*: An ability to use modern engineering tools to produce engineering analysis in a systematic manner.*	Criterion #1 Ability of using modern engineering tools	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.8	Meet the expectation
Outcome #3	Criterion #2 Quality of analysis	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.7	Meet the expectation Approximately 10 new DE 6000-level courses have been added. There will be continued work on adding engineering math and science courses.
Outcome #3					3.8	Met the target
Outcome #4*: An ability to complete a doctoral dissertation and effectively communicate the dissertation work orally and in writing.*	Criterion #1 Dissertation significance	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.8	Meet the expectation
Outcome #4	Criterion #2 Organization of Dissertation	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.7	Meet the expectation. This criterion is an improvement over that of the previous report. The ENGR 6110 Professional Seminar course added the content on how to write a dissertation.

Outcome #4	Criterion #3 Dissertation presentation & delivery	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.8	Meet the expectation
Outcome #4	Criterion #4 Question & answer - impromptu skills	Dissertation/field study report	By the student's dissertation committee	2.8 or > 70%	3.4	Meet the expectation
Outcome #4					3.7	Met the target

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.*
Add courses, delete some courses that are no longer needed. There will be continued work on adding engineering math and science courses.	P	Multiple courses were added and removed from the catalog. This is an ongoing effort. Multiple course addition requests are in progress.
Review and modify the existing syllabi and change course prerequisites. There will be continued work on reviewing and modifying the syllabi.	P	Some existing syllabi have been reviewed and revised. More course syllabi will be reviewed and revised by the departments. This is an ongoing project.
Implement the new DE degree plan.	P	Implement the new DE degree plan.

The College of Engineering is increasingly holding seminars in various fields of study, which all DE students are encouraged to attend.	P	There will continue to be a commitment to providing high-quality research lectures for students.