

End of Year Assessment Report for Programs

Program: Engineering

Academic Year: 2020-2021

Program Director: David Probst

Submission date:

Year in Operational Plan: We are in Year 2 for collection of initial assessment data for ABET accreditation, so we are collecting data from all courses the first two years. We will shift to every other year in AY21-22 and collect data for PO's 1-4 in Year 1 and POs 5-8 in Year 2.

Assessment Methods and Benchmarks

Based upon your operational plan, what components of your program are assessed this year? For each program objective being assessed this year, report the data you have collected for Introductory, Developmental, and Mastery levels. Put this information in a chart. Refer back to Section D in your Operational Plan. Because this year has not been a particularly normal year, you may have adjusted your plans. Therefore, report on the data you have available.

Program Objective	Introducing	Developing	Mastering
PO1. Complex Problem Solving	PHYS200 CO3 HW Average	ENGR332 CO2 HW3-6, Exam 2, Projects 1-3	ENGR402 CO1, 2 Project Reports, Weekly Reviews, Design Review
	Benchmark: >=75%	Benchmark: > =75%	Benchmark: > =75%
	Evidence: 50% met	Evidence: 100% met	Evidence: 75% met (3 of 4 students)
PO2. Design	ENGR101 CO4 Projects	ENGR332 CO3 HW7, 8, Projects 1-3	ENGR401 CO2 Project Reports
	Benchmark: > =75%	Benchmark: > =75%	Benchmark: > =75%
	Evidence: 90% met	Evidence: 100% met	Evidence: 100% met
PO3. Communication	ENGR101 CO5, CO7 Project Reports, Essays, Service	ENGR240 CO5 Presentations, Project	ENGR402 CO4 Weekly Reviews, Reports, Presentations
	Benchmark: >=75%	Benchmark: > =75%	Benchmark: > =75%
	Evidence: 90%, 80% met	Evidence: 50% met	Evidence: 75% met
PO4. Recognize Ethical and Professional Responsibility	ENGR101 CO1, CO2, CO3, CO6 Project Reports, Essays, Service	ENGR360 CO1-4 Assignments and Exams	ENGR402 Project Reports, Presentations
	Benchmark: >=75%	Benchmark: > =75%	Benchmark: > =75%
	Evidence: 80%, 80%, 95%, 80% met	Evidence: Not Taught	Evidence: 75% met
PO5. Function Effectively on a Team	ENGR101 CO1, CO2, CO3, CO6	ENGR240 CO3 Teamwork, Presentations, Project	ENGR402 Teamwork, Presentations, Weekly Reviews
	Benchmark: >=75%	Benchmark: > =75%	Benchmark: > =75%
	Evidence: 80%, 80%, 95%, 80%	Evidence: 50% met	Evidence: 75% met
PO6. Conduct Experiments	PHYS200 CO4 Lab Reports	ENGR332 CO3 HW7, 8, Projects 1-3	ENGR402 CO3 Testing Final Design
	Benchmark: >=75%	Benchmark: > =75%	Benchmark: > =75%
	Evidence: 89% met	Evidence: 100% met	Evidence: 75% met

PO7. Acquire New Knowledge	ENGR240 CO4 CAD & Design Projects	ENGR340 CO1-3 Final Project	ENGR401 CO7 Project Reports, Presentations
	Benchmark: >=75%	Benchmark: > =75%	Benchmark: > =75%
	Evidence: 50% met	Evidence: 100% met	Evidence: 100%
PO8. Serve World from Christian Character	ENGR101 CO1, CO2, CO3, CO5, CO6	ENGR340 CO1, Final Assignment	ENGR360 CO5 Service Project
	Benchmark: >=75%	Benchmark: > =75%	Benchmark: > =75%
	Evid: 80%, 80%, 95%, 90%, 80%	Evidence: 100% met	Evidence: Not Taught

**The chart above is merely an example template. Please make sure to edit the chart to reflect your operational plan for the current year*

Analysis of Assessment Findings

Discuss the significance of the findings of the current year in light of the desired results, findings from previous years, recent changes in the program or the assessment process, etc. What did you learn from the assessment? In particular:

(1) What strengths and weaknesses do the findings reveal about the program?

(2) What strengths and weaknesses do the findings reveal about the assessment process?

(3) What impact have program changes in recent years had on student learning (indicate those program changes that resulted from previous assessment findings)?

(4) What impact have recent changes in the assessment process had on the quality and usefulness of the findings? Of particular importance to note are recent changes and improvements in the program that resulted from previous assessment efforts.

(1) The results above indicate that at least 75% of students met the benchmark of 75% in every indicator except one. The indicator for PO1 at the Introductory level indicates that only 50% of the Engineering students met the benchmark. We try to be quite intentional about helping students develop their skills of solving problems in PHYS200 where this assessment is done. PHYS200 University Physics I is a first-semester course, so some students are not certain Engineering is the right major for them based on their interests and aptitudes. Clearly, developing students' problem-solving skills will be especially important for those students who move into the sophomore level courses. However, we must always keep in mind that our classes are small, so this represents two of four Engineering students that took PHYS200 in Fall 2000 who failed to meet the benchmark. In this case, their lack of performance can be attributed to external factors such as attendance and being beginning freshmen adjusting to college life. At least one of these students improved their performance in PHYS210 University Physics II.

POs 3 and 5 are assessed at the Developing level in ENGR240 Engineering Design and CAD. Again, this was a small class of six students in Spring 2021. The assessment results are largely understood by looking at the specific students in the course. Again, two students performed poorly due to external issues (family issues for one, an addiction to gaming for another), and one student has a fairly serious learning disability that makes personal interaction with others extremely challenging for him. So, these results cannot be understood to represent any systemic program issues at this time.

(2) After meeting with Eric Watterson, Dean of Assessment, we decided that we need to work toward having better alignment of assignments or averages and COs/POs. We also decided to work toward having D2L automatically collect as much of the assessment data as possible in each course. I was able to partially do this in ENGR230 in Spring 2021. We will try to fully implement this change throughout next year.

(3) After reviewing the content of the FE Exam for Other Disciplines, with which our curriculum best aligns, we have decided to add ENGR322 Mechanics of Materials to the core requirements. Most students already took this course as one of their engineering electives, but this addition to the core reduces the minimum number of free electives to three credit hours and the program will total 121 credit hours beginning in Fall 2021.

Sharing and Discussion of Assessment Findings

Describe how assessment findings are typically shared and discussed among program faculty and other stakeholders. In particular, make clear the process for analyzing assessment findings and using them to make improvements in the program and/or the assessment process.

During the May Convention, the FACT meets to discuss the assessment findings from the previous year. In addition, faculty discuss assessment results from our courses throughout the academic year during our regular faculty meetings. The FACT met for AY20-21 on 28 May 2021.

Use of Assessment Findings for Program Improvement (Action Plan)

(A) Describe any changes in (1) the program and/or (2) the assessment process that are planned in response to the assessment findings from this academic year.

(B) Briefly summarize the status of the previous year's or semester's action plans. Are they complete, still being implemented, on hold, or some other status?

(C) For each intended improvement or change in the program stemming from this year's data, provide a detailed timeline for follow-up data collection, data analysis, and data review.

(D) Based on your CDL assessment exercise, describe how you will make programmatic changes to better prepare your students to demonstrate high levels of achievement on the UNIV 401 SLOs.

(E) Indicate your plans to make your program more experiential in the coming year?

(A) As mentioned above, we have added ENGR322 to the core beginning Fall 2021, and we are working towards improving alignment of assignments, COs and POs as well as automating the data collection as much as possible using D2L.

(B) We added the labs to ENGR230 and ENGR322. ENGR230 included the lab in the Spring 2021 offering and ENGR322 will include the lab in the Fall 2021 offering.

(C) We will continue to mentor students in PHYS200 to grow in their understanding of God's calling for their vocation and to grow in academic discipline in order to be better prepared for sophomore-level Engineering courses.

(D) Our students satisfy UNIV401 by taking ENGR402. No changes are planned as our students do quite well here.

(E). The program is already very experiential. Students take three Physics courses, a Chemistry course, and either a Biology course or a second Chemistry course, all with labs. In addition, ENGR 230 and ENGR322 now have lab components. Finally, the Senior Design sequence (ENGR401, 402) is extensively experiential with students being required to interact with a client (often external), research, plan, design, build, and test a design intended to meet a set of constraints and incorporate appropriate engineering standards. Students may also complete an internship, for credit or not, during one or more of their summers. No additional experiential learning is planned at present.

Supporting Documents

[If you attach any supporting documents, please list them here. You may submit these supporting documents into the D2L dropbox.]

The FCARs from AY20-21 were used in compiling and evaluating the assessment data. For AY19-20 and AY20-21, we are collecting data on each PO. Beginning with the AY21-22, we will follow a schedule in which half of the POs are assessed and evaluated each year so that all POs will be assessed and evaluated every two years.