End of Year Assessment Report for Programs

Program: Engineering	Academic Year: 2019-2020
Contact Person: David Probst	Submission date: 05/18/20

Program Mission Statement

The Engineering program strives to provide students with quality education in engineering in a caring Christian environment.

Program Objectives

At the close of their degree, students should be able to demonstrate:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies
8. a commitment to serve the world with passion and integrity that stem from a Christian mind and Christian character

Assessment Methods and Benchmarks – AY2019-2020

For each program objective, choose one "best representative" assignment at the Introductory, Developmental, and Mastery levels. You will have a total of three assignments/measurements per program objective. Put this information in a chart. Refer back to your Program Learning Objective Alignment Chart to determine best representative assignments and benchmarks. In any given semester, you may not have assignments at all three levels for every program objective; simply report all that you can.

Program Objective	Introducing	Developing	Mastering
PO1. Complex Problem Solving	PHYS200 CO3 HW Average	ENGR332 CO2 HW, Exams, Projects	ENGR402 CO1, CO2, Project Reports, Weekly Reviews, Design Reviews
	Benchmark: >=75%	Benchmark: >=75%	Benchmark: >=75%
	Evidence: 78% completion	Evidence: 100% completion	Evidence: 100% completion
PO2. Design	ENGR101 CO4 Projects	ENGR332 CO3 Projects	ENGR401 CO2 Project Reports
	Benchmark: >=75%	Benchmark: >=75%	Benchmark: >=75%
	Evidence: 100% completion	Evidence: 100% completion	Evidence: 100% completion
PO3. Communication	ENGR101 CO5, CO7 Project Reports, Essays, Service	ENGR240 CO5 Teamwork, Presentations	ENGR402 CO6 Project Reports, Design Reviews, Presentations
	Benchmark: >=75%	Benchmark: >=75%	Benchmark: >=75%
	Evidence: 78% completion	Evidence: 91% completion	Evidence: 100% Completion
PO4. Recognize Ethical and Professional Responsibility	ENGR101CO1, CO2, CO3, CO6 Project Reports, Essays, Service	ENGR360 CO1, CO2, CO3, CO4 Assignment and Exam Average	ENGR402 CO8 Project Reports, Presentations
	Benchmark: >=75%	Benchmark: >=75%	Benchmark: >=75%
	Evidence: 78% completion	Evidence: 90% Completion	Evidence: 100 % completion
PO5. Function Effectively on a Team	ENGR101 CO2, CO3, CO5, CO6 Project Reports, Essays, Service	ENGR240 CO3 Teamwork, Presentations	ENGR402 CO5 Teamwork, Weekly Reviews, Presentations
	Benchmark: >=75%	Benchmark: >=75%	Benchmark: >=75%
	Evidence: 78% completion	Evidence: 91% completion	Evidence: 75% completion
PO6. Conduct Experiments	PHYS200 CO4 Lab Reports	ENGR332 CO3 Projects 1 and 2	ENGR402 CO3
	Benchmark: >=75%	Benchmark: >=75%	Benchmark: >=75%
	Evidence: 100% completion	Evidence: 100% completion	Not Measured - Covid
PO7. Acquire New Knowledge	ENGR240 CO4 CAD Project	ENGR340 CO1-3	ENGR401 CO7 Project Reports, Presentations
	Benchmark: >=75%	Benchmark: >=75%	Benchmark: >=75%
	Evidence: Not Measured	Evidence: Not Taught	Evidence: 100% completion
PO8. Serve World from Christian Character	ENGR101 CO2, CO3, CO5, CO6 Project Reports, Essays, Service	ENGR340 CO1	ENGR360 CO5 Service Project (Canceled due to Covid)
	Benchmark: >=75%	Benchmark: >=75%	Benchmark: >=75%
	Evidence: 78% completion	Evidence: Not Taught	Evidence: Not Measured - Covid

Analysis of Assessment Findings – AY2019-2020

Discuss the significance of the findings of the current semester in light of the desired results, findings from previous semesters/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 and/or the assessment process?
(2) What impact have program changes in the last several years had on student learning (indicate those program changes that resulted from previous assessment findings)?
(3) 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 that was measured. The indicators for PO5 have the lowest completion rate, so it seems clear that we need to be more intentional about helping students develop their skills of working on a team. This is especially important for the ENGR402 Capstone course where students are expected to perform at the mastery level for this PO. 25% students did not achieve the desired benchmark. However, we must keep in mind that our classes are small, so this only represents one or two students.

(2) The program is only a few years old, as is the current assessment process at GU. It is maturing. We have been working to better align the POs with course objectives (COs) and to better align assignments as the appropriate indicators of achievement of the COs. We met with Eric Waterson, Dean of Assessment and Institutional Research, to review some new course proposals and to improve the alignment of POs, COs, and assignments. This meeting has prompted us to review all syllabi and revise the Assessment Alignment Tables contained therein. One change that has been made that resulted from the previous FACT recommendations is to reorganize ENGR201 and ENGR301 into ENGR110 and ENGR240. This content realignment clearly distinguishes the computer programming and the design and CAD content, which we hope will improve the student understanding of both topics.

One change that has been made from discussions at faculty meetings outside the formal assessment process is that we felt that students in the program needed more lab experience, so we added a lab to ENGR230 Electrical Circuits, which is a required course. We also added a lab to ENGR322 Mechanics of Materials, which is an elective that most students are choosing to take.

(3) We anticipate that the revisions described in (2) above will enhance our assessment process. We will know more when we look at the results of AY20-21 assessment.

Sharing and Discussion of Assessment Findings – AY2019-2020

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.

The Faculty Assessment and Continuous Improvement Team (FACT), which consists of a committee of the whole, did not meet in Spring 2020 due to the COVID pandemic. It met on 19 May 2021 to review and discuss the results from AY19-20.

Use of Assessment Findings for Program Improvement (Action Plan) – AY2019-2020

(A) Describe any changes in (1) the program and/or (2) the assessment process that are planned in response to these assessment findings.
(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 semester's data, provide a detailed timeline for follow-up data collection, data analysis, and data review.

(A) (1) One change to the core will be made. ENGR230 Electrical Circuits will add a lab session each week and one credit hour. This will add one hour to the program core and reduce the number of free electives from seven credit hours to six. ENGR322 Mechanics of Materials, which is an elective of that students desiring to have a mechanical emphasis in their program typically take, will also add a lab session each week and one credit hour. Both of these changes are the result of discussions among the faculty members that students need more lab experience as part of the program beyond what they get as part of their basic science courses. (2) No changes in the assessment process are planned other than what is described in item (2) of the Analysis section above.

(B) The action plans from the AY18-19 have been implemented. All dealt with changes to individual courses.

(C) Some of the courses mentioned were used for program assessment again in AY19-20 and are detailed above.

Full Year Reflection – AY2019-2020

Recall the Program Assessment Action Plan from the Fall semester. Now that you have two semesters of following this data collection and reporting format, reflect on your assessment strategy: How well does the data support your learning objectives? Do your procedures for gathering and reviewing information need to be modified? What was done as a response to assessment data in the past? How did it go? Did you make the intended changes from your program's Fall Action Plan, and are you on track with your timeline?

The program assessment process is still maturing, but it is coming along nicely. Our data and its evaluation definitely inform potential improvements at this point.

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 AY19-20 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.