Course Outcomes Guide (COG)

Course Title: Instrumentation and Process Control I- ELE113

Date: August 2019

Course Team: Juan C. Luna.

Expected Learning Outcomes

• Identify the various types of instrumentation used in industry.
• Understand basic control techniques, specifically PID loop control.
• Understand control systems and terminology.

Assessment (How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)

At the end of the Fall 2018 semester, the instructor administered a final ELE113 assessment exam. The assessment exam covers all course outcomes. The final grade is a composition of the final exam, homework assignments, and hands-on activities.

Validation (What methods have you used or will you use to validate your assessment?)

The course outcomes and assessment tool for Instrumentation and Process Control I (ELE 113) are consistent and aligned with recommendations from the following IEEE publications:

Merging Pedagogical Approaches: University of Glasgow-UESTC Joint Education Programme in Electronics and Electrical Engineering. K. Meehan et al.
Frontiers in Education Conference (FIE), 2014 IEEE. 978-1-4799-3922-0

Intelligent Performance Assessment of Students’ Laboratory Work in a Virtual Electronic Laboratory Environment. Achumba et al.
IEEE TRANSACTIONS ON LEARNING TECHNOLOGIES, VOL. 6, NO. 2, APRIL-JUNE 2013

Assessment of undergraduate electrical engineering laboratory studies. G. Carter et al.

The final grade comprises a combination of homework, lab activities, with several exams in between. A final assessment exam can determine the overall comprehension of the subject, although it will not measure other components typical of lab activities, like team player skills, hands-on expertise. The final assessment exam cannot measure homework effort and time management skills. Nevertheless, the final assessment exam can be an expected consequence of the effort put into the lab and homework activities.
Results (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)

As it was expected the final grade is highly correlated with completion of assignments, lab activities, quizzes and exams.

17/FA Circuits, Schem, & Test Equip (ELE-158-01)

COMPARISONS TO PREVIOUS SEMESTERS:

Assessment Final Exam Results: Fall 2017

The overall average score for the exam was 88.53%, the median was 88.03%, and the highest score was 97.3%. The sample size was 8 for the Fall 2017 semester. There is no breakdown by relevant course outcome questions.

Spring 2017. N=8
**Assessment Final Exam Results: Fall 2018**

The overall average score for the exam was 73.14%, the median was 75.00%, and the highest score was 92%. The sample size was 8 for the Fall 2018 semester.

There is no breakdown by relevant course outcome questions.

**Fall 2018. N=7**

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**Strengths & Weaknesses:**

Based in the data, most students perform extremely well in questions pertaining to
• Identify the various types of instrumentation used in industry.
• Understand basic control techniques, specifically PID loop control.
• Understand control systems and terminology.

The difference in performance was mainly because a new edition of the textbook had too many typos and exercises out of context, which impaired the overall course performance. A new textbook is suggested for next semester.

Follow-up (How have you used or how will you use the data to improve student learning?)

Student surveys and student performance in this course suggested that there were two factors in place that were lowering the course performance. One of the factors was that the new edition of the textbook was deficient and contained too many mistakes. The other factor was the lab constantly having issues related to old computer equipment.
A new textbook has been selected for this course. At the same time, an improved lab is proposed with new computer equipment.

Budget Justification (What resources are necessary to improve student learning?)

No additional resources needed.