Course Outcomes Guide

Course Title: Instrumentation and Process Control II ELE 213   **Date:** May 2018

Course Team: Juan C Luna

Expected Learning Outcomes:

- Have a sound introduction to microcontroller hardware.
- Understand the fundamentals of hardware programming techniques in C and assembly language.
- Read with proficiency reference material and microcontroller code.
- Understand the theory and operation of motor control code and circuitry.
- Be able to interface microcontroller peripherals with external sensors and motors.

Assessment:

At the end of Spring 2018 semester, the instructor administered an ELE213 assessment exam. The assessment exam covers all course outcomes. There was no data from previous semesters to analyze or compare.

Validation:

The course outcomes and assessment tool for Instrumentation and Process Control II (ELE 213) 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. IEEE PROC, Vol. 127, Pt. A, No. 7, SEPTEMBER 1980

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.
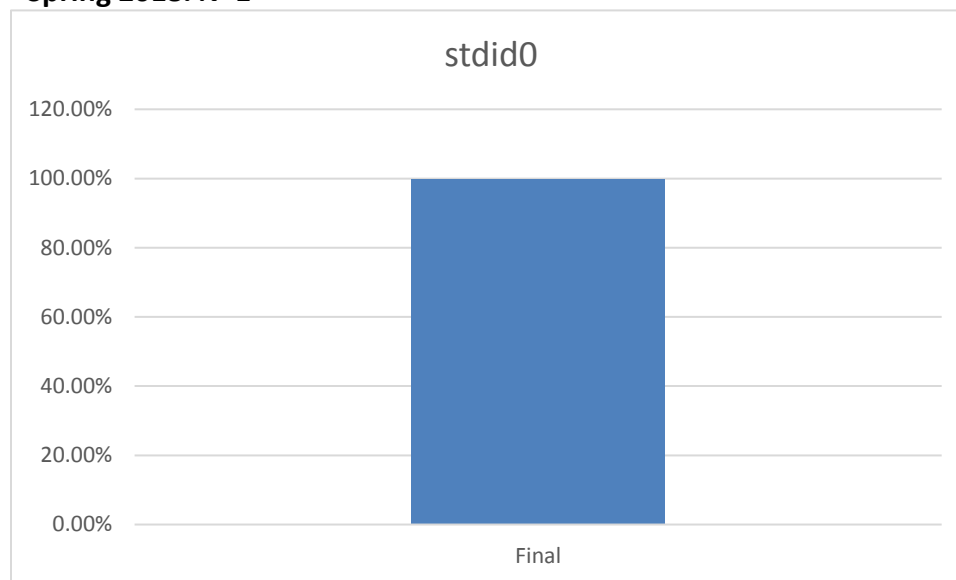
Results:

Assessment Final Exam Results: Spring 2018

The overall average score for the exam was 100%, the median was 100%, and the highest score was 100%. The sample size was 1 for the Spring 2018 semester.

Since the sample was not statistically significant, no relevant course outcome question breakdown was done.

Spring 2018. N=1



Average Relevant Course Outcome Question: N/A

Strengths & Weaknesses:
Based in the data, most students perform extremely well in questions pertaining

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Assessment Final Grade Results: Spring 2018

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

18/SP Instrumentation & PC II (ELE-213-01)
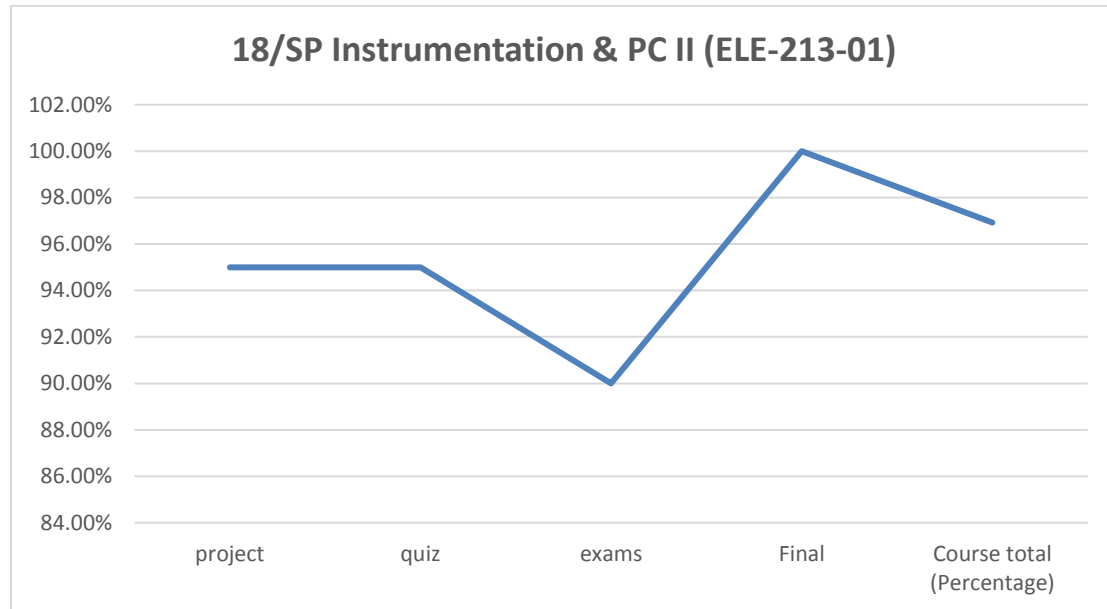
From the above graph, the data shows that the final grade is strongly correlated with Quizzes and Assignments.
This data shows how important are <u>all</u> the core assessment components.

This course was taught on a tutorial basis. The textbook (Industrial Automated Systens, 1st Edition; Terry Bartelt, 2011 Cengage) had only one section appropriate for this course related to Motion Control. Most of the other concepts in the textbook were covered by previous material on **Instrumentation** and Process Control I. Textbook should be revised for the next year.

 COMPARISONS TO PREVIOUS SEMESTERS :

 N/A

Follow-up
- The data will be evaluated to improve teaching techniques
- The results will be used to alter the course content to focus on areas were students had the most issues

Budget Justification
No additional resources needed.