Course Assessment- Part B: Your Results & Analysis

COMPLETE #580

Please select your course and name from the drop-down menu. If your course or name are incorrect or missing, contact Sara Wade, the Instructional Services Administrative Assistant, 541-506-6037 or swade@cgcc.edu.

EET 221- Semiconductor Devices and Circuits- Kalie Brunton- Fall 2022

*** Part B: Your Results DIRECTIONS 1. Report the outcome achievement data gathered via the assignments, tests, etc. you identified for each outcome (question 3) of your Part A. (Only include data for students who completed the course. Do not include students who withdrew or earned an incomplete) Data for all 3 outcomes should be reported below.**

Data concerning the success of meeting course outcomes was gathered from eight quizzes and two written exams with practical portions, as well as in-lab verbal discussions and hands-on troubleshooting time. Written quizzes and exams assessed student ability to interpret schematic diagrams, describe circuit functionality, and perform mathematical circuit analysis. These written assessments were the primary means of evaluating success on outcomes #1 and #2. The majority of students significantly increased their understanding of semiconductor devices and circuits, from very little knowledge of diode and transistor applications at the beginning of the course to scoring an 85% class average on exam #1 and #2. Outcome #3 focused on hands-on lab time and troubleshooting experience; assessment included monitoring the lab-completion rate. While 27% of students achieved an 88% lab-completion rate, the remainder of students achieved a 100% lab-completion rate. Verbal in-lab discussions revealed that students were drawing connections between lab exercises and real-world scenarios, as well as improving their ability to diagnose circuit errors/faults on their own.

*** Outcome #1**

Identify various types of diodes and transistors, explain their theory of operation, and contrast their applications.

*** % of students who successfully achieved the outcome (C or above)**

93

*** Outcome #2**

Apply electrical concepts to analyze circuits containing semiconductor components.

*** % of students who successfully achieved the outcome (C or above)**

93

*** Outcome #3**

Build and troubleshoot circuits with diodes and transistors using instrumentation tools to observe circuit characteristics and computer software to model circuits.

* % of students who successfully achieved the outcome (C or above)

100

* ANALYSIS 3. What contributed to student success and/or lack of success?

Throughout this course, I was mostly pleased with the level of student engagement. This being the first time I have taught this (or any) class, I have taken special note of student feedback and given much thought to how I can better promote their success in future iterations of the course. This (first) time through, I largely attribute their success to their level of interest, thoughtful questions, and time spent studying at home and practicing in the lab. A handful of highly engaged students took the initiative to ask for clarification during lecture and help their classmates during lab. Student collaboration is something I want to directly encourage in the future, as throughout this term I witnessed the benefits of a student group that is working together. Additionally, the two-hour lecture, three-hour lab format for this course contributed to student success. This format provided ample time for students to work with equipment and gain troubleshooting experience, which is where the most important learning occurs in a CTE course.

* 4. Helping students to realistically self-assess and reflect on their understanding and progress encourages students to take responsibility for their own learning. Please compare your students' perception of their end-of-term understanding/mastery of the three outcomes (found in student evaluations) to your assessment (above) of student achievement of the three outcomes.

While I lack data from written student evaluations of the course, verbal feedback and student engagement has communicated to me that students have maintained interest in the material and see the relevance of what they are learning. I plan to allocate class time for completing written course evaluations in the future, as I am sure that many students have suggestions for the course that they have not communicated to me verbally.

* 5. Did student achievement of outcomes meet your expectations for successfully teaching to each outcome (question 4 from Part A)

Yes.

* 6. Based on your analysis in the questions above, what course adjustments are warranted (curricular, pedagogical, student instruction, etc.)?

There are many aspects of this course I want to implement differently in the future; I have learned much from my first term of teaching. In the future, I want to preface the course with an in-class discussion of what students are hoping to gain from the course, what they already know about semiconductors, and revisit this discussion throughout the term to gauge student perception and evaluate their understanding of the topics. I also really liked a suggestion from one of the "Monday Morning Mentor" videos which recommended using a fillable pie chart, with slices of the chart representing different topics/assignments, and allowing students to fill in the chart as the course moves along, creating a color-code to self-assess their understanding of the material. I think this visual representation of progressing knowledge/mastery would be a powerful tool for the students and myself as their instructor. Additionally, there are some logistical changes I want to make regarding the order of content and the specifics of lab exercises. A key objective of the classes taught in the Em-Tech program is to teach students how to troubleshoot electrical circuits. While the emphasis of written exams and lab projects is on technical/conceptual understanding, the process of troubleshooting is a vital skill all on its own, and in the future I would like to better highlight this for the students, drawing attention to their progress in developing this skill, even when their lab projects don't work as expected the first time through.

7. What resources would be required to implement your recommended course adjustments (materials, training, equipment, etc.)? What Budget implications result?

At this point, I have all the necessary materials and equipment to conduct this course. Now that I am getting my feet under me as a new instructor, I want to continue to develop my teaching ability, learning from other instructors and various PD tools.

* 8. Describe the results of any adjustments you made from the last assessment of this course (if applicable) and their effectiveness in student achievement of outcomes.

This was my first time teaching or evaluating this course, no previous data available.

9. Describe how you explain information about course outcomes and their relevance to your students.

As a class, we look at the course outcomes when we review the syllabus/topics for the course. I ask students about their career goals so I can speak to the relevance of course objectives to their desired careers throughout the term.

10. Please describe any changes/additions to instruction, curriculum or assessment that you made to support students in better achieving the CGCC Institutional Learning Outcomes: ILO #1: Communication. The areas that faculty are focusing on are: "Content Development"and/or Control of Syntax and Mechanics" and ILO #2: Critical Thinking/Problem Solving. The areas that faculty are focusing on are: "Evidence" (Critical Thinking) and/or "Identify Strategies" (Problem Solving). ILO #4: Cultural Awareness. The area that faculty is focusing on is: "Curiosity" - Encouraging our students to "Ask deeper questions about other cultures and seek out answers to these questions" ILO #5: Community and Environmental Responsibility. The area that faculty are focusing on are: "Applying Knowledge to Contemporary Contexts" and "Understanding Global Systems" ILO#3 - Quantitative Literacy - "Application/Analysis" and/or "Assumptions"

I did make several "in-flight" adjustments during this first term that specifically addressed ILOs #1, #2, and #3, and I plan to implement further adjustments for this course in the future, as outlined in my responses above. Asking students questions about their lab projects is something I tried to do increasingly, desiring to support them not only in acquiring new knowledge but also developing their ability to communicate that knowledge (ILO #1). As the term went on, I also would restrain myself from helping them to immediately correct errors made in constructing their circuits, allowing them time to develop their own troubleshooting methods and skills (ILO #2). Additionally, I noticed that at times students were memorizing graphical depictions of component behavior rather than gleaning a deeper understanding of what the graph was conveying, so I re-wrote exam questions and held in-class discussions to help students develop their ability to analyze and understand the implications of data rather than simply commit data to memory (ILO #3).