Electrical Engineering Technology
Canino School of Engineering Technology
2019 Assessment Report

- Curriculum Coordinator: Dr. Stephen Frempong
- Date of Presentation: January 15, 2020

SUNY CANTON

Electrical Engineering Technology (AAS-Degree)

Program Educational Objectives (PEO's)

PEO (1) - Provide industry with well qualified technicians for entry level positions in the Electrical Engineering Technology field.

PEO (2) - Provide transferability for students who are interested in B.E.T. degree at SUNY Canton or other institutions.

Bachelor of Electrical Engineering Technology (B.E.E.T)
Program Educational Objectives (PEO's)

Upon graduating from the (B.E.E.T) degree program in Electrical Engineering Technology at the State University of New York at Canton, graduates will:

PEO (1) - Be effective and ready for positions in Electrical Power Industries;
PEO (2) - Be effective and ready for positions in Electronics Industries;
PEO (3) - Be effective and ready for positions in industrial controls and computer related industries;
PEO (4) - Be effective and ready for positions in Telecommunications related industries;
PEO (5) - Be able to perform circuits analysis and be skilled in technical writing and oral communication;
PEO (6) - Be ready to expand knowledge in Electrical Engineering Technology profession through continuing education, or other lifelong learning experiences.

What was assessed

ISLO 5 – ISLO 5: Industry, Professional, Discipline-Specific Knowledge and Skills (Demonstrate the knowledge and skills necessary to succeed as leaders of tomorrow in their chosen career path)

ABET- CRITERION (3) STUDENT OUTCOMES 1,2,4,5

(1) an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline;

(2) an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;

(4) an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes; and

(5) an ability to function effectively as a member as well as a leader on technical teams.

Courses Mapped to (ISLO's), ABET Student Outcomes, and (PEO's)

COURSES ASSESSED	ISLO #5	ABET – Student Outcomes	Program Educational Objectives (PEO's)
ELEC 101	X	1, 2, 4, 5	X
ELEC 231	X	1, 2, 4, 5	X
ELEC 213	X	1, 2, 4, 5	X
ELEC 416	X	1, 2, 4, 5	X
ELEC 385	X	1, 2, 4, 5	X

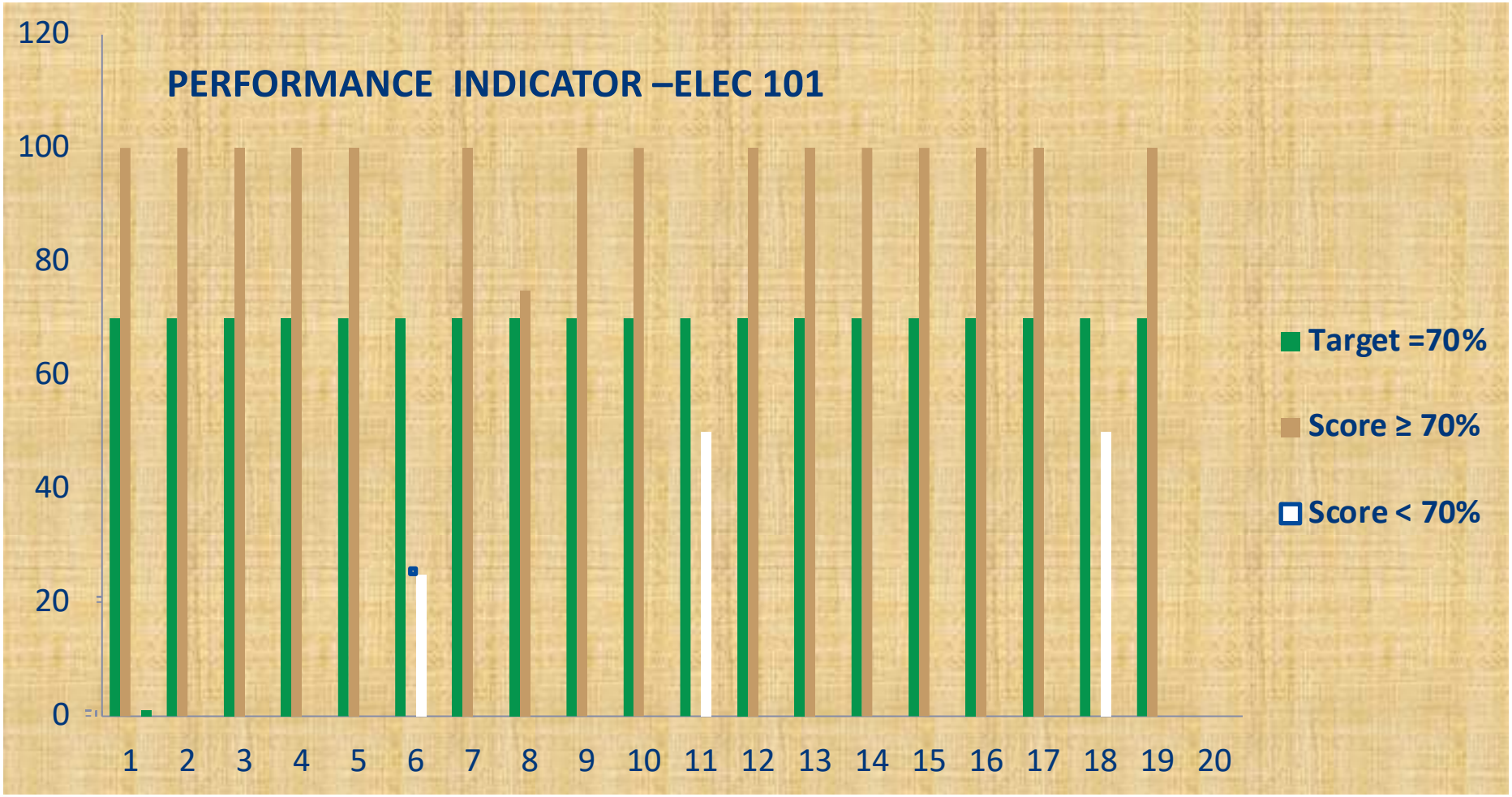
Course: ELEC 101 Electric Circuit I (DC)-Fall 2019

What is Assessed: Student ability to solve basic design problem

- **Instructor:** Dr. Stephen Frempong
- **TARGET :** 70% of students will score 70% or higher on the test.
- **Number of students in class: 20**

- **Students Performance:**

  85% of students scored above 70% or higher on this design test, and as such the target was exceeded.
- **Performance Analysis:**
- 15% of students either missed the design problem, or received partial credit. The problem asked students to design a voltage divider to allow 6 Volts, 30 mA bulb to be used in Automobile Electrical System with 12 Volts supply. They also have to determine the wattage of the resistor needed to protect the bulb.


PERFORMANCE INDICATOR –ELEC 101
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Target =70%
Score ≥ 70%
Score < 70%

ELEC 385 Electronic Communications I - FALL 2019
Instructor: Dr. Stephen Frempong

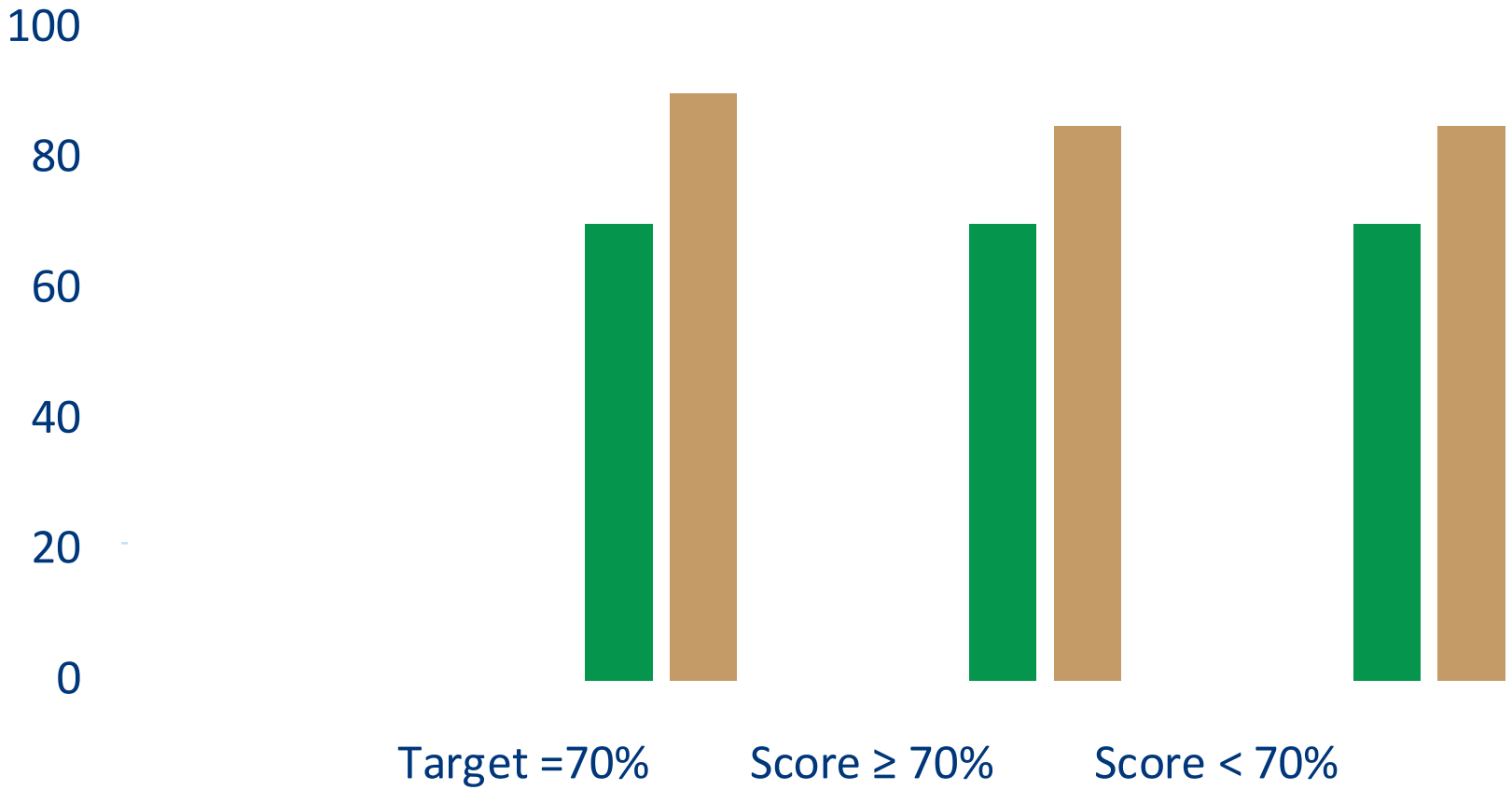
- **<u>What is Assessed:</u> Design L-Network, LCC T-Network and calculate the values of inductance and capacitance required in both networks.**

- **TARGET: 70% of students are expected to score 70% or higher on the test.**
- **Students Performance:**

  75% of students scored 70% or higher on the test, and target was met.
- **Performance Analysis:**
- 75% of students missed question #2. This question asked students to design L-Network and perform calculations for the inductance and capacitance.
- 25% of students received partial credit for #3. This question asked students to design LCCT-Network, and calculate the values for capacitance and inductance.

Number of students: 4

PERFORMANCE INDICATOR – ELEC 385



Course: ELEC 231 Electronic Circuits **FALL - 2019**

What is Assessed: Perform calculations on Electronic Circuits

Instructor: Dr. Stephen Frempong

TARGET: 70% of students will score 70% or higher on the test.

Student Performance:

70% of students scored 70% or higher on the midterm test, and target was met.

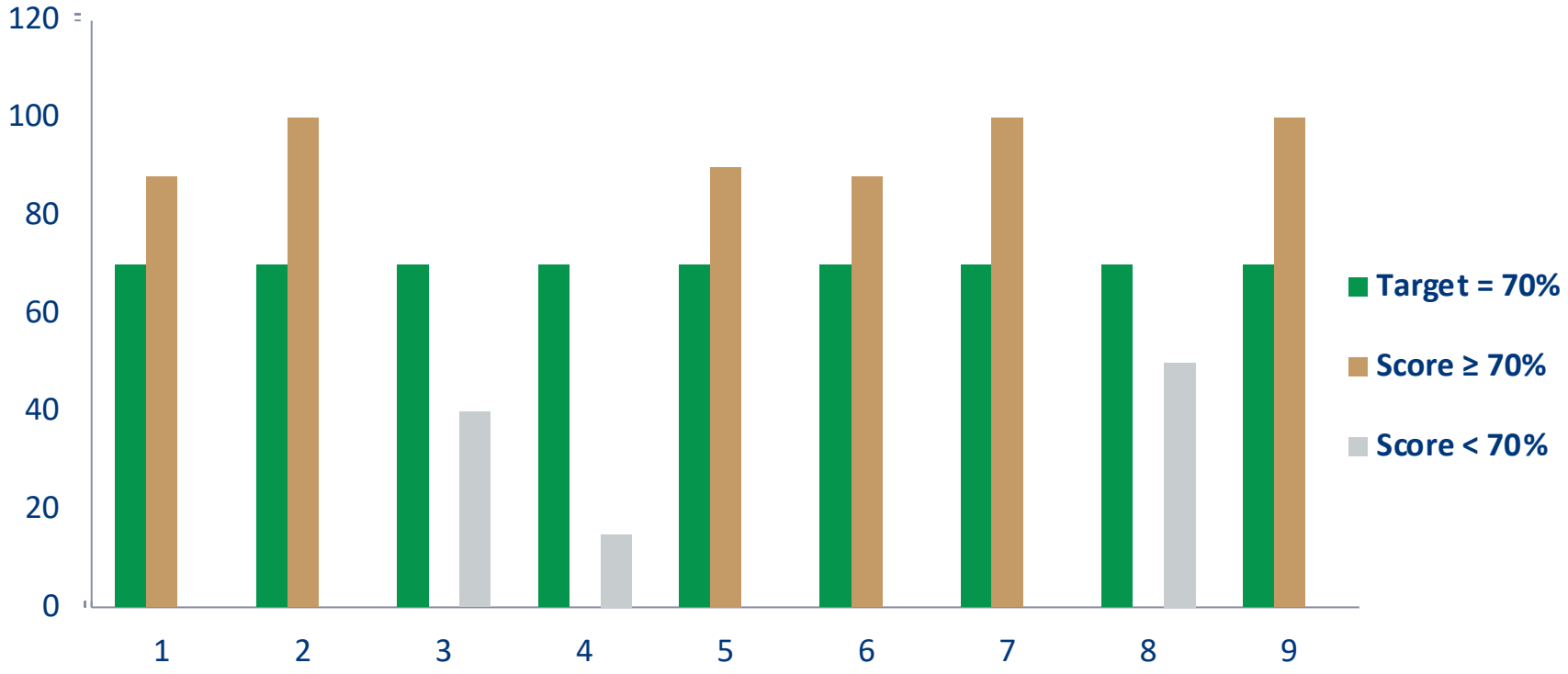
Performance Analysis:

30% of students either missed or received partial credit for question #1. This is a two stage amplifier that students had to calculate for the voltage gain of each stage, overall voltage gain, and expressed in dB.

33% of students either missed or received partial credit for question #5. This was collector feedback bias circuit, and students were asked to calculate VB, VC, IC, and VCE.

Number of students: 9

PERFORMANCE INDICATOR–ELEC 231



Course: ELEC 231 Electronic Circuits

FALL - 2019

What is Assessed: Laboratory Skills

Instructor: Dr. Stephen Frempong

TARGET: 70% of students will score 70% or higher on the test.

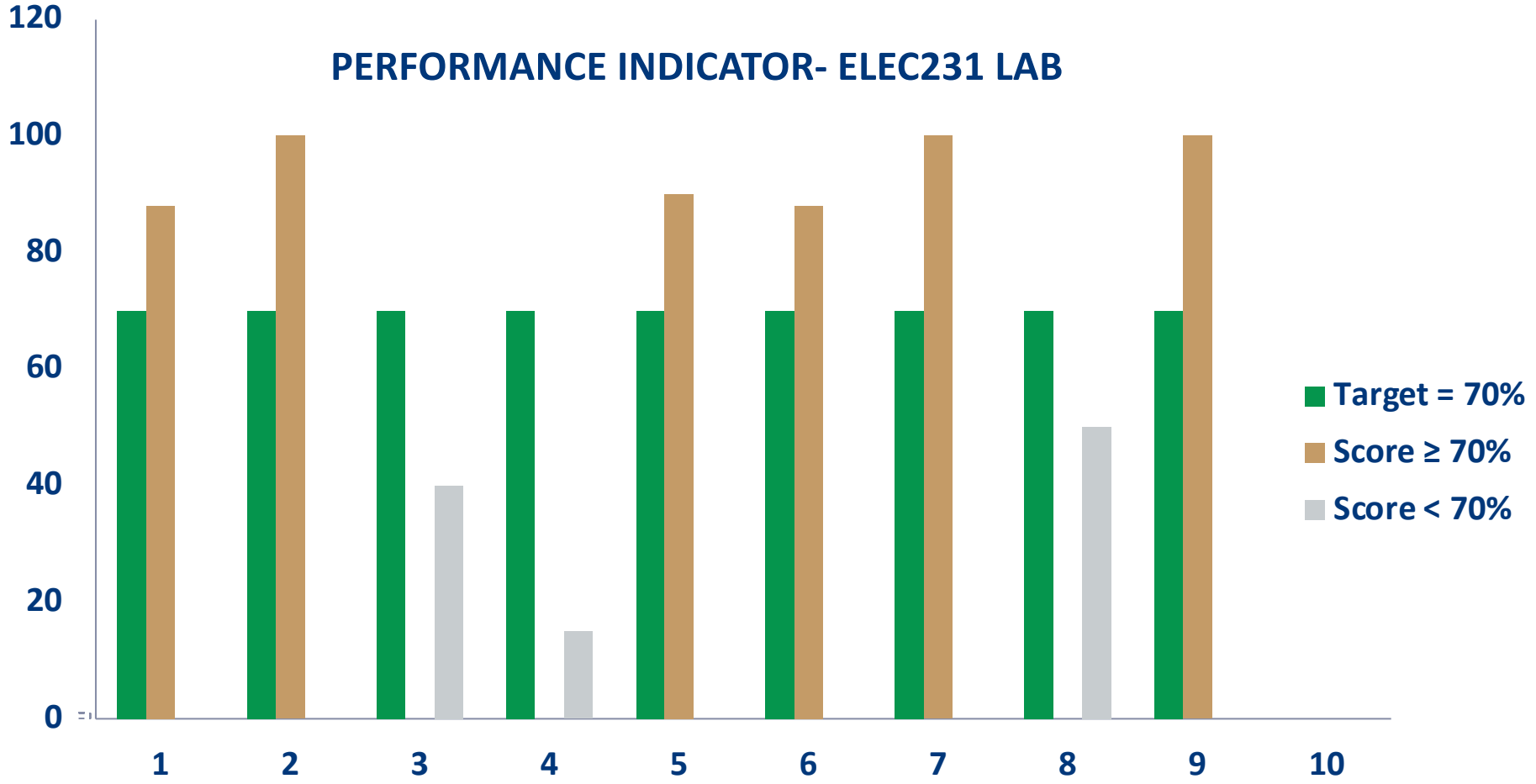
Students Performance:

66.7% of students scored 70% or higher on laboratory test. On this test, students had to construct a Common Source Amplifier circuit using Field Effect Transistor, and perform various voltages and currents measurements. The target was not met.

Performance Analysis:

20% of students made mistakes in the construction of the circuit, and as such, they measured the currents and voltages incorrectly.

Number of students: 9


PERFORMANCE INDICATOR- ELEC231 LAB
120
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
Target = 70%
Score ≥ 70%
Score < 70%

ELEC 213 Microprocessors- Fall 2019

Instructor: Dr. Sani Shahrokh

What is Assessed: Understanding of computer organization, hexadecimal and binary representation; I/O registers, parallel port, memory-mapped I/O, data direction register, C programming, digital enable register and run mode clock gating control register; interfacing switches and LEDs with microcontroller; how to develop SysTick and PLL as a means to control time in microcontroller; Finite State Machines.

Student will understand: microcontroller (CPU, Bus, Memory, I/O port), Arithmetic Logic Unit, Control Unit, Registers, Bus, Von Neumann, Harvard architecture; how the SysTick counter and PLL works; how determine the steps required to initialize a parallel port and use it as either input or output; how develop and implement Finite State Machines in microcontroller. These satisfy ABET outcomes (1-4) and ISLO (5).

- **Target:** 70% of students are expected to score 70% or higher on the test.
- **Students Performance:**
- 85% of students scored 70% or higher on the test and target was met.

ELEC 213 CONTINUE -

Performance Analysis:

- 20% percent of students missed questions#1-3 (partially or completely). These questions ask about computer organization, hexadecimal and binary representation an C programming.
- 18% percent of students missed question#4 (partially or completely). This question asks student determine the steps required to initialize a parallel port and use it as either input or output.
- 15% percent of students missed question#5 (partially or completely). This question asks student how the SysTick timer and PLL works.
- 5% percent of students missed question#6 (partially or completely). This question asks student to how interfacing LEDs and switches with microcontroller.
- 15% percent of students missed question#7 (partially or completely). This question asks student to develop and implement Finite State Machines in microcontroller.
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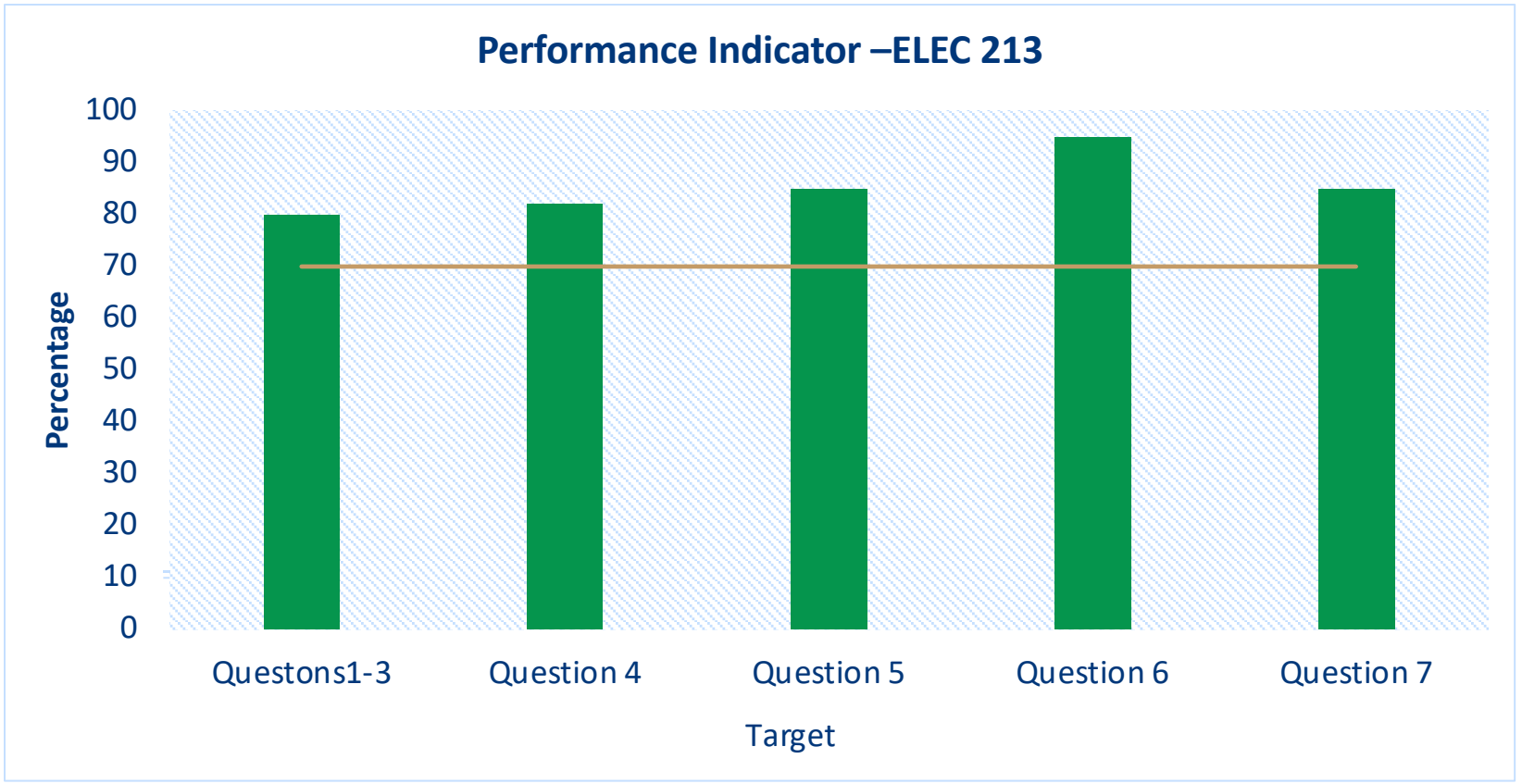
Number of students: 7


Performance Indicator –ELEC 213
Percentage
100
90
80
70
60
50
40
30
20
10
0
Questons1-3
Question 4
Question 5
Question 6
Question 7
Target

ELEC 416 Microelectronic Circuit Design- Fall 2019

Instructor: : Dr. Sani Shahrokh

What is Assessed: Outcomes#2-5: Analyzing and designing the characteristics of basic, Wilson and Cascade bipolar and MOSFET circuits used to provide a constant output current; Describe the characteristics and terminology of bipolar and MOSFET differential amplifier.

Student will learn how to: analyze, design BJT and MOSFET current source (current mirror); analyze and determine the characteristics of the basic bipolar and MOSFET differential amplifier. These satisfy

ABET outcomes (1) and ISLO (5)

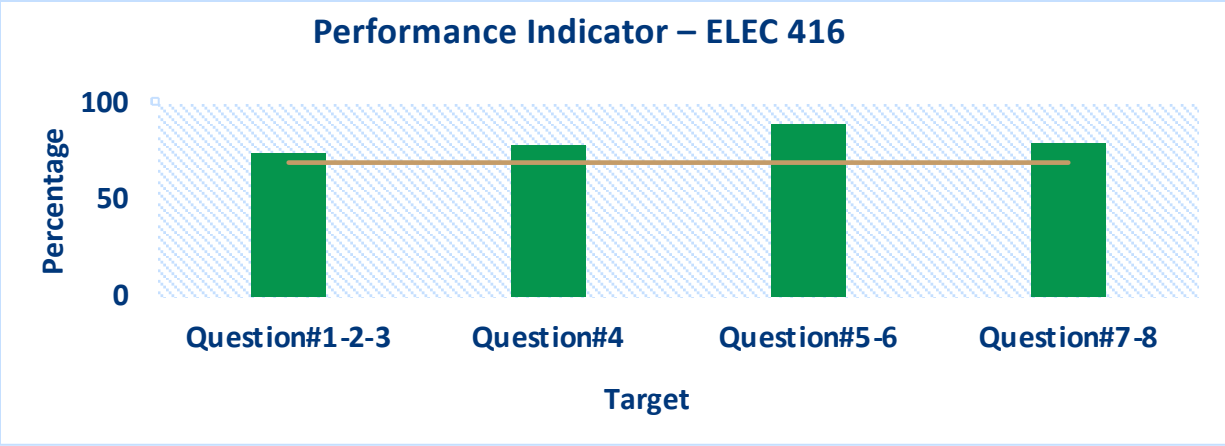
- **Target:** 70% of students are expected to score 70% or higher on the test.
- **Students Performance:**

  80% of students scored 70% or higher on the test and target was met.

ELEC 416 CONTINUE -

Performance Analysis:

- 25% percent of students missed questions#1-3 (partially or completely). These questions ask student about characteristics of current sources.
- 21% percent of students missed question#4 (partially or completely). This question asks student about characteristics of differential amplifier.
- 10% percent of students missed questions#5-6 (partially or completely). These questions ask student to analyze and design BJT and MOSFET current mirrors.
- 20% percent of students missed questions#7-8 (partially or completely). These questions ask student to analyze and design BJT and MOSFET differential amplifier.



Evaluation

- ELEC 101 - Evaluation of Students performance show that some of the 15% were able to determine the value of the resistor needed to protect the bulb, but they failed to calculate and select the minimum wattage for the available resistors. It also shows that 85% of the students understood the design example that the instructor went over in class before the test.
- ELEC 231 -Evaluation of student performance indicates that some students used wrong formulas in questions #1 and #5. This means that students need more understanding of different electronic circuits.
- ELEC 231LAB - Most of the students who did not measure currents and voltages correctly had circuit construction problems. Some connected the FET transistor wrongly which resulted in wrong data.
- ELEC 213 - Student performance evaluation on the final exam shows that some students were not well prepared for the exam.
- ELEC 213LAB - Student performance evaluation on this lab project shows that lack of enough basic programming knowledge is a challenge for some students.
- ELEC 385 - My evaluation of student performance on the test show that, some students used wrong formulas which resulted in wrong calculated values for the components needed for the L- Network design, as well as LCC T-Network design.
- ELEC 416 - . Student performance evaluation on the final exam shows that some of students were not well prepared for the exam .

Improvement Plans and Closing the Loop

ELEC 101- As a result of student performance exceeding the 70% target, no improvement plan is needed at this time.

ELEC 231LAB - More laboratory test will be given to students in this course to help them gain experience

Electronic Circuits construction, measurements, and troubleshooting. Instructor will stress the importance of spending more time in the laboratory building, testing, and troubleshooting electronic circuits.

ELEC 231- Instructor plans to spend more time on two state amplifier calculations, as well as different bias circuits. Students will be asked to build and perform measurement in the laboratory for the circuits that they have problems with. They can then compare the calculated results with practical data. This will improve student performance when the course is taught again.

ELEC 213 - No recommendations needed at this time since students exceeded the target.

ELEC 213LAB - Instructor plan to spend more time in the class for C programming language. Also, student will be encouraged to use the engineering tutoring lab and instructor office hours to get the basic knowledge that they need to do lab projects.

ELEC 385 - Instructor plans to assign more practice problems to students, and also spend more time on topics where students had difficulty as indicated on performance indicator.

ELEC 416 - No recommendations needed at this time since students exceeded the target.

Resources Being Requested for Improvement and to Close the Loop?

EET programs would like to request $3,000 to hire two senior students to assist students who need help in a form of extra tutoring specifically for Electrical Engineering Technology students. Arrangement will be made for such group of students to meet outside class hours, and possibly to meet on Saturdays for few hours.