

PROGRAM ASSESSMENT REPORT

Program Code CFIET	Name Industrial Electronics Technology
Division ATM	Department Industrial Technology
Award <input type="checkbox"/> A.A. <input type="checkbox"/> A.S.	<input type="checkbox"/> A.A.S.
<input checked="" type="checkbox"/> Cert. <input type="checkbox"/> Adv. Cert.	<input type="checkbox"/> Post-Assoc. Cert. <input type="checkbox"/> Cert. of Completion

I. Review previous assessment reports submitted for this program and provide the following information.

1. Was this program previously assessed and if so, when?

No

2. Briefly describe the results of previous assessment report(s).

n/a

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

n/a

II. Background Information

1. Indicate the semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
ELE 254:2013, 2014	ELE 254: 2014, 2015 ELE 211: 2017, 2018, 2019	

2. Assessment tool(s) used (check all that apply):

- Portfolio
- Standardized test
- Other external certification/licensure exam (please describe): _____
- Graduate Survey
- Employer Survey
- Advisory Committee Survey
- Transfer follow-up
- Externally evaluated performance or exhibit
- Externally evaluation of job performance (internship, co-op, placement, other)
- Capstone experience (please describe):
- Other (please describe):

3. Have any of these tools been used before?

Yes (if yes, identify the tool below and describe any changes made since it was last administered)

No

Changes:

4. Indicate the number of students assessed/total number of students enrolled in the course(s)/program.

25 ELE 254, 53 ELE 211

5. Describe how you selected students for the assessment.

a. Describe your sampling method.

b. Describe the population assessed (e.g. students in capstone course, graduating students, alumni).

All students in each class for semesters shown above

III. Results

1. State every outcome (verbatim) from the Program Assessment Planning or Program Proposal form for the program. *Add more lines as needed.*

1. Identify the electrical properties of resistive, inductive, and capacitive devices and analyze their behavior in DC and AC series, parallel, and series-parallel circuits.

2. Analyze, interpret, and troubleshoot analog electronic amplification and control circuits.

3. Analyze, interpret and troubleshoot programmable logic controller (PLC) controlled systems.

2. Briefly describe assessment results based on data collected during the program assessment, demonstrating the extent to which students are achieving each of the learning outcomes listed above. ***Please attach a summary of the data collected (as a separate document).*** *Add more lines as needed.*

1. We decided not to include ELE 111 in the assessment for two reasons. 1) Some students take ELE 111 who do not complete the certificate so it's not a representative population. 2) Assessing the upper level courses in the program is more relevant than the very first course.

2. We were disappointed in the results for ELE 211. For all three course outcomes, less than 70% of the students scored $\geq 75\%$ which was the standard created years ago. (Col BO in spreadsheet.) Even with a lower standard, in only one course outcome did students score $\geq 70\%$. (Col BM in spreadsheet.) Looking at the Grade Distribution (graph at S45 on spreadsheet), 21% of the students did quite well (88%) and 9.6% of the students did quite poorly ($< 54\%$). Some of these poorly scoring students somehow got into the class without meeting the ELE 111 prereq. Many of them didn't have the practical math skills even if they did manage to reach the prereq Math Level. We noted that there is a sizeable group of students who scored in the 54-71% range. We hope to be able to "move up" these students into the $\geq 70\%$ range in the future. See below for some of our plans.

3. 71% of the students scored 75% or better on the ELE 254 final exam. 82% of students achieved a score of 70% or better. The average final exam score was 78%. We also looked at student scores on the Lab Quizzes and found that 93% of the students achieved a score of 75% or better. Compared to several years ago, we are getting younger, less motivated students in the program. Also more of our motivated students are working full time or overtime and getting less support from their employers so they just don't have the time to study, especially for something like the final exam. We do get excellent feedback from individual students regarding how useful the PLC courses have been on the job, so we are confident we are teaching the right skills at the right level. It's just been difficult figuring out how to motivate some students.

4. For each outcome assessed, indicate the standard of success used, and the percentage of students who achieved that level of success. ***Please attach the rubric/scoring guide used for the assessment (as a separate document).*** Add more lines as needed.

1. Not assessed.

2. Over all outcomes 58% of students scored 75% or better on the ELE 211 final exam. The criteria of 75% of the program students will have successfully achieved the given outcome with a score of 75% or better on the final exam for ELE 211 was not met. 69%, 60% and 63% of students scored >75% on the individual outcomes. We believe that a more appropriate standard would be that 70% of the students achieve 70% or better on the final exam. (This is the standard used for the ELE 211 course assessment.) With this criteria we would still be at only 63% of students however.

3. 71% of the students scored 75% or better on the ELE 254 final exam. 82% of students achieved a score of 70% or better. The criteria of 75% of the program students will have successfully achieved the given outcome with a score of 75% or better on the final exam for ELE 254 was not met. We believe that a more appropriate standard would be that 70% of the students achieve 70% or better on the final exam. (This is the standard used for the ELE 254 course assessment.) Our ELE students are mostly hands-on learners and typically do not perform as well on written exams as they do on hands-on evaluations.

5. Describe the areas of strength and weakness in students' achievement of the learning outcomes shown in assessment results.

Strengths:

2. ELE 211 areas of strength were SCR circuit analysis; optoelectronic control of solid state relay circuit analysis; the definition of FWD and REV bias of BJT transistors; and analysis of basic op amp circuits.

3. ELE 254 Strengths were understanding analog input and output configuration; process control, other than PID; and Function Block Diagram programming.

Weaknesses:

2. ELE 211 areas of weakness included analyzing LED and zener diode circuits; performing calculations on power supply circuits; BJT circuit calculations; and analysis of more complex circuits.

3. ELE 254 Analog input wiring is the main area of concern. Students have learned about wiring in at least two prior courses at this point, it is a basic and important skill, and they shouldn't be having so much trouble with it at the end of the program. Analog t/s questions on the final exam are especially difficult since students have to be able to mentally work through a process that they would walk through physically on the job.

Indirect addressing is a relatively advanced programming skill that tends to be understood by the more computer savvy students.

Process Control: Some students with less math background had trouble understanding the effects of PID control.

PLC Communications – test questions involved more memorization than other parts of the test.

Structured text programming was difficult for students without prior programming background.

IV. Changes influenced by assessment results

1. Based on the previous assessment report Action Plan(s) identified in Section I above, please discuss how effective any changes were in improving student learning.

N/A

2. If weaknesses were found (see above) or students did not meet expectations, describe the action that will be taken to address these weaknesses. If students met all expectations, describe your plan for continuous improvement.

ELE 211: We will expand on the lab exercises where students will calculate what the results should be and then measure to confirm. We will use worksheets to review this material prior to the final exam. BJT circuits are covered earlier in the course and students may not be remembering the material by the end of the semester. We will spend more time in class practicing analyzing complex circuits.

ELE 254: We will incorporate hands-on assessments (lab Quizzes) into the next assessment cycle. We think that combining the hands on assessment and the final exams we will get a more accurate picture of how prepared students are to enter the workforce.

3. Identify any other intended changes that will be instituted based on results of this assessment activity. Describe changes and give rationale for change. (Check all that apply).

a. Outcomes/assessments from Program Assessment Planning or Program Proposal form:

Outcome 1 will be removed, and ELE 111 will be removed as an assessment tool, since it is not relevant to the program assessment. A third outcome will be added and assessed using relevant questions from ELE 254 Lab Quizzes: Configure, program and troubleshoot programmable logic control (PLC) controlled systems.

- b. Program Curriculum:
 - Course sequencing
 - Course deletion
 - Course addition
 - Changes to existing program courses (specify):
 - Other (specify):

- c. Other (specify):

4. What is the timeline for implementing these actions?

Winter 2020

V. Future plans

1. Describe the extent to which the assessment tools used were effective in measuring student achievement of learning outcomes for this program.

We learned that the ELE 211 final exam needs better balance between the different outcomes, and that ELE 254 Lab Quizzes should be included in the assessment.

2. If the assessment tools were not effective, describe the changes that will be made for future assessments.

We will modify the ELE 211 final exam to achieve better balance between the different outcomes, and add ELE 254 Lab Quizzes to the assessment.

Submitted by:

Name: Dale Petty  Date: 6/26/19
Print/Signature

Department Chair: Tom Pennino / Tom G. Pennino  Date: 7/20/2019
Print/Signature

Dean: Brandon Tudor  Date: 7/23/19
Print/Signature

Please return completed form to the Office of Curriculum & Assessment, SC 257.