

ELECOMP Capstone Design Program

ABET Student Outcomes

Fall 2022 Semester

Outcome 1: (ELE480-Fall 2022) : An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science, and mathematics

The emphasis seems to be on **solving** a problem that meets the definition of complex, i.e., having **one or more** of the following characteristics:

- Wide ranging technical issues
- Conflicting technical issues (trade offs)
- Having no obvious solutions
- Not covered by current standards or codes
- Involving diverse groups of stakeholders
- Many component parts or sub-problems
- Involving multiple disciplines

Evaluation: *From the Grading Breakdown, each designer's score for the Individual Technical Contributions in the Major Progress Report, MPR #2, will be taken into account; it reflects one or more of the above characteristics in their capstone project. The maximum score is 50%. This will be divided by 10, rounded to the nearest digit, and the score will be loaded on the department website, for tracking this Outcome, and providing data for the ABET Evaluators. (no extra work is required)*

Outcome 3 (ELE480-Fall 2022) : ability to communicate effectively with a range of audiences [it is the program's responsibility to determine the most meaningful audiences. Sample audiences: faculty, students, non-technical, public sector, engineering manager.]

Evaluation: *From the Grading Breakdown, each designer's total score will be determined for written and oral communication skills: the slides preparation, and the oral presentation, for the Symposium. The maximum score is 20%. This will be divided by 4, rounded to the nearest digit, and the score will be loaded on the department website, for tracking this Outcome, and providing data for the ABET Evaluators. (no extra work is required)*

Outcome 5 (ELE480-Fall 2022) : an ability to function effectively on a team whose members together **1**-provide leadership, **2**-create a collaborative and inclusive environment, **3**-establish goals, **4**-plan tasks, and **5**-meet objectives

Evaluation: *Jack Murphy will send a Google Form, on 12/11/22, to get self-evaluation by each designer, only on these two aspects: (1) Leadership and (2) Collaborative and inclusive environment. (Tasks 3, 4 and 5 are already included in Outcome 1 above) Suitable questions will be posed and the answers will be evaluated out of 5%, with no effect on the final score, for the course grade. The individual score, 1 through 5, will be loaded on the department website, for tracking this Outcome, and providing data for the ABET Evaluators.*

Fall 2022 & Spring 2023 Semesters

Outcome 2 (ELE480 and ELE481): an ability to apply engineering design to produce solutions that meet specified needs with consideration of: **1-safety** (health and welfare), **2-global**, **3-cultural**, **4-social**, **5-environmental**, **6- economic factors**.

Must show all six factors are **considered** as they engage in the design process.

Also, the following **elements of design must** be incorporated:

1-identifying opportunities, **2-developing requirements**, **6-considering risks**, **7-making trade offs**

Evaluation: *Appendix A in MPR#2 and MPR#3; see below.*

Outcome 4 (ELE480 and ELE481): ability to **recognize** ethical and professional responsibilities in engineering situations **AND**

Make informed judgements, which **must consider the impact** of engineering solutions in : **1-global**, **2- economic**, **3-environmental**, and **4-social** contexts.

(combine with Outcome 2 as the six considerations in Outcome 2 include the 4 considerations in Outcome 4

Evaluation: *Appendix A in MPR#2 and MPR#3; see below.*

Appendix A in Major Progress Reports #2 and #3

(Initial Answers to be provided in MPR#2;

Further updates/final evaluations to be provided in MPR#3)

Three Options are available for each of the 11 ELEMENTS of Design below:

- 1. Applicable and addressed in MPR#2: Just identify the page(s) in MPR#2**
- 2. Applicable but not addressed in MPR#2: Discuss briefly below the element and/or state if more will be available/discussed in CPR in April 2023.**
- 3. Not applicable to your capstone Project: Just put NA for this element**

1. Identifying Opportunities (Project Motivation)
2. Developing Requirements (Functional Specifications in the ABO)
3. Risk Evaluation to achieve the ABO
4. Making Design Trade-offs
5. Safety Considerations (health and welfare)
6. Local & Global Implications and Impact
7. Cultural Implications and Impact
8. Social Implications and Impact
9. Environmental Implications and Impact
10. Economic Implications and Impact
11. Ethical Implications and Impact

