ELECOMP Capstone Design Program

ABET Student Outcomes

Spring 2023 Semester

Outcome 1: (ELE481-Spring 2023) : 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 Comprehensive Progress Report, CPR, 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) Scores will be evaluated by the technical directors of the sponsoring company.*

Outcome 3 (ELE481-Spring 2023) : 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 Summit. 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) Scores will be evaluated by the Program Director, Dr. Sunak.*

Outcome 5 (ELE481-Spring 2023): 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 04/16/23, to get self-evaluation by each designer, only on these two aspects: (1) Leadership and (2) Collaborative and inclusive environment.* ***Each member of the team will also provide peer-evaluations for the leadership aspect.*** *(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. From this data, consulting technical directors will assign each designer a score out of five points. The individual score, 1 through 5, will be loaded on the department website, for tracking this Outcome, and providing data for the ABET Evaluators. Scores will be evaluated after relevant feedback from the teams by consulting technical directors.

Spring 2023 Semesters

Outcome 2 (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#3; see below. S Scores will be evaluated after relevant feedback from the teams by consulting technical directors.*

Outcome 4 (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#3; see below. After review of Appendix A, consulting technical directors will provide a score out of 5, which will be the same for each designer on the team. Scores will be evaluated after relevant feedback from the teams by consulting technical directors.*

APPENDIX A- TEMPLATE FOR COMPLETION

Final evaluations for ABET Outcomes 2 and 4.

These 4 Aspects are Engineering related and are covered by ALL teams in the MPR#3 above.

1. **Identifying Opportunities (Project Motivation)**
   (copy and paste from MPR#3 above)

2. **Developing Requirements (Functional Specifications in the ABO)**
   (copy and paste from MPR#3 above)

3. **Making Design Trade-offs**
   (copy and paste from MPR#3 above)

4. **Risk Evaluation to achieve the ABO**
   (copy and paste from MPR#3 above)

These 7 Aspects are non-Engineering related and MUST be discussed by ALL teams in this Appendix. The quality of the discussions will determine the score for each designer on the team.

5. **Economic Implications and Impact** *(copy & paste from MPR#2 and/or MPR#3; and/or Discuss further with a paragraph. If not applicable to your project, you must justify why, with a paragraph)*

6. **Local & Global Implications and Impact** *(copy & paste from MPR#2 and/or MPR#3; and/or Discuss further with a paragraph. If not applicable to your project, you must justify why, with a paragraph)*

7. **Safety Considerations (health and welfare)** *(copy & paste from MPR#2 and/or MPR#3; and/or Discuss further with a paragraph. If not applicable to your project, you must justify why, with a paragraph)*

8. **Environmental Implications and Impact** *(copy & paste from MPR#2 and/or MPR#3; and/or Discuss further with a paragraph. If not applicable to your project, you must justify why, with a paragraph)*

9. **Ethical Implications and Impact.** *(copy & paste from MPR#2 and/or MPR#3; and/or Discuss further with a paragraph. If not applicable to your project, you must justify why, with a paragraph)*

10. **Cultural Implications and Impact.** *(copy & paste from MPR#2 and/or MPR#3; and/or Discuss further with a paragraph. If not applicable to your project, you must justify why, with a paragraph)*

11. **Social & Societal Implications and Impact.** *(copy & paste from MPR#2 and/or MPR#3; and/or Discuss further with a paragraph. If not applicable to your project, you must justify why, with a paragraph)*

Further Instructions: Save this Appendix A separately, and label it as a pdf document:"Team Name"-ABET-2-4-SPR23 and upload to google form sent by Jack.