BEE Learning Outcomes and Associated Assessments

Learning Outcome 1: Mastery and Application of Core Disciplinary Knowledge
Description: Ability to demonstrate an understanding and application of engineering fundamentals appropriate for the area of study within the field.

Assessment:
- Faculty Advisor’s Evaluation
- Graduation Exit Survey
- Job Placement & Career Path Statistics
- Alumni Feedback & Involvement (5yr Survey)

Learning Outcome 2: Problem Formulation and Solution
Description: Candidates demonstrate the ability to identify, formulate and solve an engineering problem in their area of study within the field. Candidates effectively utilize appropriate scientific and engineering techniques and methodologies in the problem solving process.

Assessment:
- Faculty Advisor’s Evaluation
- Graduation Exit Survey

Learning Outcome 3: Collaborative Problem Solving
Description: Ability to work productively with others in advisor’s lab group.

Assessment:
- Faculty Advisor’s Evaluation

Learning Outcome 4: Communication of Knowledge, Ideas and Decision Justification
Description: Ability to effectively identify and articulate the pros and cons of potential problem approaches and solutions.

Assessment:
- Faculty Advisor’s Evaluation

Learning Outcome 5: Professional Development & Career Advancement
Description: Graduates are equipped to assume increased technical and personal responsibilities as they advance in their professional careers.

Assessment:
- Job Placement & Career Path Statistics
- Alumni Feedback & Involvement (5yr Survey)
Outcome 2-- Candidate demonstrates the ability to identify, formulate and solve an engineering problem in their area of study within the field. Candidate effectively utilizes appropriate scientific and engineering techniques and methodologies in the problem solving process.

Ability to identify, formulate and solve an engineering problem

I was able to clearly demonstrate my abilities, surpassing my program expectations

My abilities were demonstrated, meeting my expectations for program

I was unable to demonstrate my abilities to the extent I had planned

Commentary: MY suggestions for program improvement is this area-

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Utilization of appropriate scientific and engineering techniques and methodologies

I was fully able to utilize techniques and methodologies, surpassing my program expectations

I was able to utilize techniques and methodologies, meeting basic expectations for program

I was not able to utilize techniques and methodologies to the extent I had planned

Commentary: MY suggestions for program improvement is this area-

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3. **Job Placement & Career Path Statistics**
Job placement information is collected from each graduate as part of the graduation survey. The department maintains an alumni database that includes career path information. This information is also requested as part of the 5-year alumni survey.

Data relevant to Outcomes 1 & 5:
First professional position/Grad school acceptance as an indicator of success in attaining Outcome 1.
First position/Grad School acceptance as first step in successful career path-Outcome 5

4. **Alumni Feedback & Involvement (5 yr Survey)**
The BEE program conducts regular surveys of alumni as part of ABET and required department reviews. The following alumni questions will be used in assessment of outcomes 1&5.

Information relevant to Outcomes 1 & 5:
Alumni self-assess their personal and professional success attributed to Outcome 1.
Alumni self-assess their career path and professional development
Documentation of BEE alumni involvement in the program, service on department review panels, advisory committees, seminar presentations, and personal feedback to the department
Assessment Rubrics

1. Faculty Advisor’s Evaluation
Faculty advisor’s evaluation will be used to assess outcomes 1-4. This final evaluation of the candidate’s work and project deliverables will be documented on the MEng checklist that is used by the BEE Graduate Field Coordinator to ‘clear’ each candidate for graduation. The following information will be supplied by the advisor upon submission of the project report and prior to graduation:

**Outcome 1**—Ability to demonstrate an understanding and application of engineering fundamentals appropriate for the area of study within the field. Check the line that applies.

Understanding of engineering fundamentals
- Understanding clearly demonstrated, surpasses basic expectations
- Understanding demonstrated, meets basic expectations for program
- Understanding lacking, does not meet basic expectations

Application of engineering fundamentals
- Application clearly demonstrated, surpasses basic expectations
- Application demonstrated, meets basic expectations for program
- Application lacking, does not meet basic expectations

**Outcome 2**—Candidate demonstrates the ability to identify, formulate and solve an engineering problem in their area of study within the field. Candidate effectively utilizes appropriate scientific and engineering techniques and methodologies in the problem solving process.

Ability to identify, formulate and solve an engineering problem
- Ability clearly demonstrated, surpasses basic expectations
- Ability demonstrated, meets basic expectations for program
- Ability lacking, does not meet basic expectations

Utilization of appropriate scientific and engineering techniques and methodologies
- Clearly demonstrated, surpasses basic expectations
- Demonstrated, meets basic expectations for program
- Not well demonstrated, does not meet basic expectations

**Outcome 3**—Collaborative Problem Solving

Ability to work productively with others in advisor’s lab group.
- Clearly demonstrated, surpasses basic expectations
- Demonstrated, meets basic expectations for program
- Not well demonstrated, does not meet basic expectations

**Outcome 4**—Communication of Knowledge, Ideas and Decision Justification

Ability to effectively identify and articulate the pros and cons of potential problem approaches and solutions.
- Clearly demonstrated, surpasses basic expectations
- Demonstrated, meets basic expectations for program
- Not well demonstrated, does not meet basic expectations
2. Graduation Exit Survey

The graduation exit survey will be used to assess outcomes 1 & 2. Each candidate completes an exit survey near the end of their final term. Surveys include additional questions regarding academics, facilities and climate. Questions specific to outcomes 1 & 2 follow:

**Outcome 1—Ability to demonstrate an understanding and application of engineering fundamentals appropriate for the area of study within the field. Check the line that applies.**

The BEE Mengr program allowed me to demonstrate my understanding of engineering fundamentals

- [ ] My understanding was clearly demonstrated, surpassing my program expectations
- [ ] My understanding was demonstrated, meeting my expectations for program
- [ ] I was unable to demonstrate my understanding to the extent I had planned

Commentary: MY suggestions for program improvement is this area-

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The BEE Mengr program allowed me to apply engineering fundamentals

- [ ] My application of engineering fundamentals clearly demonstrated, surpassing my expectations
- [ ] My application was demonstrated, meeting my expectations for program
- [ ] I was unable to demonstrate my understanding to the extent I had planned

Commentary: MY suggestions for program improvement is this area-

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