

B. Accreditation Summary

This section presents a complete description of how our program satisfies the requirements for the eight Engineering Criteria. Since our last ABET accreditation visit in 1998 was before the EC2000 implementation, this self-study report is significantly different than previous reports, especially with respect to criteria 2, 3 and 4. Also, in order to alleviate possible confusion with terminology and abbreviations, a glossary of terms is presented below.

Terminology	Definition
Educational objectives	Statements that describe the expected accomplishments of graduates during the first few years after graduation
Program Outcomes	Statements that describe what students are supposed to know and be able to do by the time of graduation
Measurable course-level outcomes	Student learning outcomes that support the broad program outcomes but are specific enough so that achievement can be measured by student work in a specific course. Demonstrating that students have achieved the course outcomes provides supporting evidence that students are achieving the high-level program outcomes.
Program indicator outcomes	A subset of measurable outcomes for which key student work outputs (primarily from the Sr. Capstone design project) will be assessed yearly, reviewed at the yearly faculty and advisory board meetings, and used as primary evidence for program assessment. These outcomes are selected so that they indicate program-level performance.
Performance Criteria	A definition of acceptable student performance relative to an outcome to allow quantitative assessment of whether or not the students have actually achieved the outcome. For each course-level outcome we specify a performance level of awareness, ability or mastery, and based on that level the course instructor identifies specific assessment evidence for each outcome (some type of student work, usually a question on a final exam or a section of a final project report) along with the criteria or characteristics of the work that indicate acceptable performance. Mastery outcomes must be demonstrated by every student that passes the tollgate course.
Tollgate Course	All course-level outcomes are addressed and formatively assessed multiple times, but the tollgate course is where the final summative assessment of an outcome takes place.
Learning Activities	The activities that are designed specifically to help students achieve the learning outcomes. Examples include lectures, demonstrations, homework with feedback, etc.
Assessment Activities	The activities that are designed specifically to assess whether or not students achieved the learning outcomes. Examples include exam questions, project reports, etc.
Area of Expertise Committees	A group of faculty that teach and do research in a specific topic area (design, thermal systems, etc.) and are given responsibility to review the assessment evidence from individual courses in their area. The committee provides oversight and broad perspective to ensure that assessment is a program-level activity rather than an individual instructor activity.
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Table B14: Performance Level Definitions**1. Awareness/Exposure**

- The awareness level corresponds to the “Knowledge” level in Bloom’s taxonomy*, and the “Worth being familiar with” category in *Understanding by Design*.
- Learning activities related to the outcome must be a required part of the course, but there is no minimum performance requirement for the students to meet.
- To assess student achievement of awareness with respect to an outcome you must document that all students have been exposed to information related to the learning outcome – for example you might document that all students attended a presentation on a topic related to the outcome and wrote a short summary on the topic.

2. Competence/Ability

- The competence level corresponds to the “Comprehension and Application” levels in Bloom’s taxonomy, and the “Important to know and do” category in *Understanding by Design*.
- Learning activities related to the outcome must be a required part of the course, and there must also be clearly defined assessment activities with clearly defined minimum performance requirements that the students must meet to demonstrate ability with respect to the outcome.
- Student achievement of competence/ability for an outcome can be demonstrated by defining an acceptable level of performance on an appropriate assessment activity and directly assessing whether or not each student meets or exceeds that level of performance. For example, to demonstrate effective oral communication you could set the assessment activity as a formal presentation and you could set several performance criteria including items like “speaks clearly and with sufficient volume” and “responds effectively to questions and comments”, then when each student makes their presentation you can assess with a simple yes/no rating whether or not each student meets each performance criteria and you can track the percentage of students who met all (or some acceptable number) of the performance criteria. This percentage should be recorded and used for comparison with previous and future results for this outcome to track continuous improvement.

3. Mastery/Understanding

- The mastery level corresponds to the “Analysis, Synthesis, and Evaluation” levels in Bloom’s taxonomy, and the “Enduring understanding” category in *Understanding by Design*.
- Learning activities related to the outcome must be a required part of the course, there must be assessment activities with clearly defined minimum performance requirements that the students must meet to demonstrate both ability and understanding, there must be significant formative feedback given to the students on the learning activities and/or assessment activities, and there must be some required reflection to force the students to synthesize and process information related to the outcome.
- Student achievement of mastery for an outcome can be demonstrated by defining an acceptable level of performance on an appropriate assessment activity (the activity must extend beyond doing to include evaluating) and documenting that all students who passed the course met or exceeded that level of performance. For example, an appropriate assessment activity could be a project that requires the student to solve an open-ended problem by synthesizing information learned in other contexts and critically evaluating the result rather than merely reporting an answer, and a mastery learning procedure could be followed requiring recycling until understanding is clearly demonstrated. For additional ideas on assessing understanding see *Understanding By Design* (in particular see the Rubric for the Six facets of understanding - Explanation, Interpretation, Application, Perspective, Empathy, Self-Knowledge - on pages 76-77).

* **From Bloom’s Taxonomy (For Reference):**

Evaluation (Employment of internal or external criteria for making critical judgments); **Synthesis** (Combining elements into a whole); **Analysis** (Breaking down a problem into its component parts); **Application** (Solving new problems with familiar principles); **Comprehension** (Translation of a concept into a somewhat different form); **Knowledge** (Recall of factual material in similar form)