Degree Program Assessment Plan

Degree Program - ENG - Chemical Engineering (BSCHE)

CIP Code: 14.0701.00
Disciplinary Accrediting Body: ABET
Next Program Review: 17-18
Degree Program Coordinator: Sindee Simon
Degree Program Coordinator Email: Sindee.Simon@ttu.edu
Degree Program Coordinator Phone: 8067423553
Degree Program Coordinator Mail Stop: 3121

Program Purpose Statement: The educational objectives of the department are threefold: 1) graduates will be successful in chemical engineering-related careers and other diverse career paths; 2) graduates will continue professional development and will pursue continuing education opportunities relevant to their careers; and 3) some graduates will pursue advanced degrees. In addition, the departmental vision is to be the undergraduate chemical engineering department of choice in Texas and to be recognized as one of the top research and graduate chemical engineering departments in the nation.
Assessment Coordinator: Sindee Simon

Student Learning Outcome:  ABET Criterion 3a
An ability to apply knowledge of mathematics, science, and engineering

Outcome Status: Active
Outcome Type: Student Learning
Start Date: 09/01/2006

Assessment Methods

Survey - Student - Exit Interviews of Graduating Seniors (Active)
Criterion: Value of 4.0 or higher on Questions 6 (Math skills) and 8 (Fundamental knowledge)
Schedule: Yearly
Related Documents: Exit Survey Results 2009

Standardized Test - Comprehensive Senior Examination (Active)
Criterion: >= 50% on the Comprehensive Senior Exam
Schedule: Yearly

Instructor Course Evaluation - Instructor self-evaluation of course (Active)
Criterion: Student learning outcome "a" met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.
Schedule: Yearly

Student Learning Outcome:  ABET Criterion 3b
An ability to design and conduct experiments, as well as to analyze and interpret data
Outcome Status: Active
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Outcome Type: Student Learning
Start Date: 09/01/2006

Assessment Methods

Survey - Student - Exit Interviews of Graduating Seniors (Active)
Criterion: Value of 4.0 or higher on Questions 9 (Experimental Design) and 10 (Data Analysis)
Schedule: Yearly
Related Documents:
Exit Survey Results 2009

Instructor Course Evaluation - Statistics quiz in ChE 4232 (Active)
Criterion: 100% of students receive C or better on statistics quiz in ChE 4232
Schedule: Yearly

Instructor Course Evaluation - Instructor self-evaluation of course (Active)
Criterion: Student learning outcome "b" met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.
Schedule: Yearly

Student Learning Outcome: ABET Criterion 3c
An ability to design a system, component, or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
Outcome Status: Active
Outcome Type: Student Learning
Start Date: 09/01/2006

Assessment Methods

Survey - Student - Exit Interviews of Graduating Seniors (Active)
Criterion: Value of 4.0 or higher on Question 11 (Design ability)
Schedule: Yearly
Related Documents:
Exit Survey Results 2009

Instructor Course Evaluation - Instructor self-evaluation of course (Active)
Criterion: Student learning outcome "c" met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.
Schedule: Yearly

Course Level Assessment - Grade in ChE 4555 Capstone Design (Active)
Criterion: 100% of students receive C or better in ChE 4555 Capstone Design
Schedule: Yearly

Student Learning Outcome: ABET Criterion 3d
An ability to function on multi-disciplinary teams
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Outcome Status: Active
Outcome Type: Student Learning
Start Date: 09/01/2006

Assessment Methods

Survey - Student - Exit Interviews of Graduating Seniors (Active)
Criterion: Value of 4.0 or higher on Questions 12 (Teamwork) and 14 (Leadership)
Schedule: Yearly
Related Documents:
Exit Survey Results 2009

Instructor Course Evaluation - Instructor self-evaluation of course (Active)
Criterion: Student learning outcome "d" met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.
Schedule: Yearly

Student Learning Outcome: ABET Criterion 3e
An ability to identify, formulate, and solve engineering problems

Outcome Status: Active
Outcome Type: Student Learning
Start Date: 09/01/2006

Assessment Methods

Survey - Student - Exit Interviews of Graduating Seniors (Active)
Criterion: Value of 4.0 or higher on Questions 3 (Critical Judgement), 4 (Creative Thinking), 5 (Problem-Solving Skills), and 13 (Independence); prior to 2012 also Question 15 (Self Confidence)
Schedule: Yearly
Related Documents:
Exit Survey Results 2009

Instructor Course Evaluation - Instructor self-evaluation of course (Active)
Criterion: Student learning outcome "e" met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.
Schedule: Yearly

Standardized Test - Comprehensive Senior Examination (Active)
Criterion: Average grade of 50% or better
Schedule: Yearly

Student Learning Outcome: ABET Criterion 3f
An understanding of professional and ethical responsibility

Outcome Status: Active
Outcome Type: Student Learning
Start Date: 09/01/2006
## Degree Program - ENG - Chemical Engineering (BSCHE)

### Assessment Methods

<table>
<thead>
<tr>
<th>Survey - Student</th>
<th>Exit Interviews of Graduating Seniors (Active)</th>
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</thead>
<tbody>
<tr>
<td><strong>Criterion:</strong></td>
<td>Value of 4.0 or higher on Questions 15 (Process Safety, after 2012), 17 (Professional Behavior) and 18 (Ethical Behavior)</td>
</tr>
<tr>
<td><strong>Schedule:</strong></td>
<td>Yearly</td>
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<td><strong>Related Documents:</strong></td>
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<tr>
<td><strong>Criterion:</strong></td>
<td>Student learning outcome &quot;f&quot; met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.</td>
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<tr>
<td><strong>Schedule:</strong></td>
<td>Yearly</td>
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<thead>
<tr>
<th>Instructor Course Evaluation</th>
<th>Environmental, Health, and Safety quiz in ChE 3232 and 4232 (Active)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criterion:</strong></td>
<td>100% of students receive C or better</td>
</tr>
<tr>
<td><strong>Schedule:</strong></td>
<td>Yearly</td>
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</tbody>
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<tr>
<th>Capstone Assignment/Project</th>
<th>External judging of capstone design project posters (Active)</th>
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<tbody>
<tr>
<td><strong>Criterion:</strong></td>
<td>100 % of teams obtain above 60 % on understanding of process hazards associated with their design</td>
</tr>
<tr>
<td><strong>Schedule:</strong></td>
<td>Yearly</td>
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### Student Learning Outcome: ABET Criterion 3g

An ability to communicate effectively

**Outcome Status:** Active  
**Outcome Type:** Student Learning  
**Start Date:** 09/01/2006

### Assessment Methods

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<td><strong>Criterion:</strong></td>
<td>Value of 4.0 or higher</td>
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<td><strong>Criterion:</strong></td>
<td>Student learning outcome &quot;g&quot; met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.</td>
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<th>External judging of capstone design project posters (Active)</th>
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<tr>
<td><strong>Criterion:</strong></td>
<td>Presentation score of &gt; 60 % with 100 % of teams meeting this minimum score</td>
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<tr>
<td><strong>Schedule:</strong></td>
<td>annual</td>
</tr>
</tbody>
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Degree Program - ENG - Chemical Engineering (BSCHE)

Student Learning Outcome: ABET Criterion 3h
The broad education necessary to understand the impact of engineering solutions in a global and societal context

Outcome Status: Active
Outcome Type: Student Learning
Start Date: 09/01/2006

Assessment Methods

Survey - Student - Exit Interviews of Graduating Seniors (Active)
Criterion: Value of 4.0 or higher on Question 19 (Awareness of the political and societal context of engineering)
Schedule: Yearly
Related Documents:
Exit Survey Results 2009

Instructor Course Evaluation - Instructor self-evaluation of course (Active)
Criterion: Student learning outcome "h" met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.
Schedule: Yearly

Capstone Assignment/Project - External judging of capstone design posters (Active)
Criterion: 100 % of teams receive above 60 % concerning analysis of the impact of their design in a societal context
Schedule: annual

Student Learning Outcome: ABET Criterion 3i
A recognition of the need for, and an ability to engage in life-long learning

Outcome Status: Active
Outcome Type: Student Learning
Start Date: 09/01/2006

Assessment Methods

Survey - Student - Exit Interviews of Graduating Seniors (Active)
Criterion: Value of 4.0 or higher on Question 20 (Ability to learn on own)
Schedule: Yearly
Related Documents:
Exit Survey Results 2009

Instructor Course Evaluation - Instructor self-evaluation of course (Active)
Criterion: Student learning outcome "i" met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.
Schedule: Yearly

Student Exit Survey - Participation in research or co-op and plans for advanced degree (Active)
Criterion: 30% or higher do student research, 15% or higher do student co-op, and 15% or higher plan on advanced degree
Schedule: Yearly
## Degree Program - ENG - Chemical Engineering (BSCHE)

### Student Exit Survey - Participation in professional organization (Active)

**Criterion:** 50% of students participate in a professional organization  
**Schedule:** Yearly

### Student Learning Outcome: ABET Criterion 3j

A knowledge of contemporary issues  
**Outcome Status:** Active  
**Outcome Type:** Student Learning  
**Start Date:** 09/01/2006

#### Assessment Methods

- **Survey - Student - Exit Interviews of Graduating Seniors (Active)**  
  **Criterion:** Value of 4.0 or higher on Question 16 (Contemporary Issues)  
  **Schedule:** Yearly  
  **Related Documents:** Exit Survey Results 2009

- **Instructor Course Evaluation - Instructor self-evaluation of course (Active)**  
  **Criterion:** Student learning outcome "j" met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.  
  **Schedule:** Yearly

### Student Learning Outcome: ABET Criterion 3k

An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice  
**Outcome Status:** Active  
**Outcome Type:** Student Learning  
**Start Date:** 09/01/2006

#### Assessment Methods

- **Survey - Student - Exit Interviews of Graduating Seniors (Active)**  
  **Criterion:** Value of 4.0 or higher on Question 7 (Computing skills)  
  **Schedule:** Yearly  
  **Related Documents:** Exit Survey Results 2009

- **Instructor Course Evaluation - Instructor self-evaluation of course (Active)**  
  **Criterion:** Student learning outcome "k" met in course as evaluated by one or more performance indicators using HWs, quizzes, exams, and/or projects.  
  **Schedule:** Yearly

- **Instructor Course Evaluation - 100% of students receive 70% or better on simulation grade in ChE 4555 Capstone Design (Active)**  
  **Criterion:** 100% of students receive C or better  
  **Schedule:** Yearly
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Student Learning Outcome: Students
The program must evaluate student performance and enforce procedures to ensure and document that students who graduate meet all graduation requirements. Students must be advised regarding curriculum and career matters.

Outcome Status: Active
Outcome Type: Program
Start Date: 09/01/2005

Assessment Methods

Self-Assessments - Preparation of a self-study report for review by program faculty and an ABET designated external accreditation evaluator. The report must describe processes and standards relating to student admissions, advisement, performance evaluation, and certification of degree completion. (Active)

Criterion: Program faculty and an ABET designated external accreditation evaluator confirm that students receive appropriate advisement and that administrative processes are effective in evaluating student admissions, academic performance, and degree completion.
Schedule: 6 year cycle

Student Learning Outcome: Program Educational Objectives
The program must have published program educational objectives that are consistent with the mission of the institution, the needs of the program’s various constituencies, and the ABET accreditation criteria. There must be a documented and effective process, involving program constituencies, for the periodic review and revision of these program educational objectives.

Outcome Status: Active
Outcome Type: Program
Start Date: 09/01/2005

Assessment Methods

Self-Assessments - Preparation of a self-study report for review by program faculty and an ABET designated external accreditation evaluator. The report must include a listing of the program educational objectives, a description of their relationship to the institutional and program mission statements, and a description of the process for their revision. (Active)

Criterion: Program faculty and an ABET designated external accreditation evaluator confirm that the published program educational objectives are consistent with the institutional mission and that the program consistently utilizes an appropriate process for their revision.
Schedule: 6 year cycle

Student Learning Outcome: Student Learning Outcomes
The program must have documented student learning outcomes that prepare graduates to attain the program educational objectives.

Outcome Status: Active
Outcome Type: Program
Start Date: 09/01/2005

Assessment Methods

Self-Assessments - Preparation of a self-study report for review by program faculty and an ABET designated external accreditation evaluator. The report must include a listing of the program's student learning outcomes and a description their relationship to the
Degree Program - ENG - Chemical Engineering (BSCHE)

Student Learning Outcome: Continuous Improvement

The program must regularly use appropriate and documented processes for evaluating the extent to which both the program educational objectives and the student learning outcomes are attained. The results of these evaluations and other available information must be utilized as input to effect continuous improvement of the program.

**Outcome Status:** Active
**Outcome Type:** Program
**Start Date:** 09/01/2005

**Assessment Methods**

- **Self-Assessments** - Preparation of a self-study report for review by program faculty and an ABET designated external accreditation evaluator. The report must include descriptions of the assessment processes used for evaluating the extent to which the program educational objectives and the student learning outcomes are attained. The report must also include summaries and analyses of the assessment results. (Active)

  - **Criterion:** Program faculty and an ABET designated external accreditation evaluator confirm that appropriate and documented processes are used for evaluating the extent to which both the program educational objectives and the student learning outcomes are attained.
  - **Schedule:** 6 year cycle

- **Self-Assessments** - Preparation of a self-study report for review by program faculty and an ABET designated external accreditation evaluator. The report must include a listing of initiatives taken to improve the program and the assessment results or other available information which motivated the initiative. (Active)

  - **Criterion:** Program faculty and an ABET designated external accreditation evaluator confirm that the program is engaged in a process of continuous program improvement that is guided by assessment results and other available information.
  - **Schedule:** continuous

Student Learning Outcome: Curriculum

The program curriculum must devote adequate attention and time to each component, consistent with the outcomes and objectives of the program and institution. Students must be prepared for engineering practice through a curriculum culminating in a major design experience based on the knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints.

**Outcome Status:** Active
**Outcome Type:** Program
**Start Date:** 09/01/2005

**Assessment Methods**

- **Self-Assessments** - Preparation of a self-study report for review by program faculty and an ABET designated external accreditation evaluator. The report must include a curriculum table, discussion of the alignment of the curriculum with the program educational objectives, and a description of the major capstone design experience. (Active)

  - **Criterion:** Program faculty and an ABET designated external accreditation evaluator confirm that the program curriculum design and implementation are consistent with the program educational objectives and outcomes.
  - **Schedule:** 6 year cycle
Student Learning Outcome: Faculty

The faculty must be of sufficient number and must have the competencies to cover all of the curricular areas of the program. There must be sufficient faculty to accommodate adequate levels of student-faculty interaction, student advising and counseling, university service activities, professional development, and interactions with industrial and professional practitioners, as well as employers of students.

Outcome Status: Active
Outcome Type: Program
Start Date: 09/01/2005

Assessment Methods

Self-Assessments - Preparation of a self-study report for review by program faculty and an ABET designated external accreditation evaluator. The report should describe the sufficiency of the faculty to cover all curricular areas of the program. This description should include the composition, size, credentials, and experience of the faculty. (Active)

Criterion: Program faculty and an ABET designated external accreditation evaluator confirm that the qualifications of the faculty are sufficient to cover all curricular areas of the program.
Schedule: 6 year cycle