

Program Plans: Outcomes and Assessment Methods

Program (CEAT) - CHE - Chemical Engineering (PhD) - 043

Program Mission Statement: A Ph.D. in Chemical Engineering from Oklahoma State University signifies that the recipient has demonstrated a breadth of advanced knowledge in the subjects that form the foundation of chemical engineering. In addition, the graduate will have demonstrated the ability to independently and efficiently make creative, relevant, significant contributions at the forefront of knowledge in traditional or emerging fields within the Chemical Engineering discipline. The program is designed to prepare the graduate with the widest possible career opportunities as a leader in industrial and academic arenas.

Program Information

2018 - 2019

Program Information

Assessment Coordinator's Name: Heather Fahlenkamp

Assessment Coordinator's E-mail Address: heather.fahlenkamp@okstate.edu

Number of Students Enrolled in the Program: 31

Total Number of Students Graduated: 6

Number of Student Graduates from Stillwater Campus: 6

Were university assessment funds used by the department/program for assessment activities?: No

Number of Student Graduates from Tulsa Campus: 0

Annual Executive Summaries

2018 - 2019

Program Assessment Coordinator: Heather Fahlenkamp

Plan Review and Approval

Date Current Plan Was Reviewed and Approved: 04/01/2017

Date of Future Plan Review and Approval: 04/01/2022

Summary of Assessment Findings

Describe overall assessment findings and faculty members' interpretation of the assessment results: OSU office of University Assessment and Testing (UAT) conducted i) a survey of Alumni in April 2019 through June 2019 and ii) Graduate Student Satisfaction Survey in February 2012 through May 2012. Further, we also administered exit interviews for the graduating students, summary of which is attached in our document repository. Most of the comments were positive with their experiences and the previous changes made to the program, as summarized in the 2017-2018 Annual Assessment Report. Students continue to excel and win a number of local awards, including an OSU Foundation Distinguished Graduate Fellowship, a Robberson Summer Dissertation Fellowship/Research and Creative Activities Grant, a Dr. Homer and Mrs. May Tang Graduate Fellowship, and a Student Government Association President Student Leader Award.

Dissemination of Findings

Describe the individual(s) or committee responsible for reviewing and interpreting assessment data: Currently all faculty in the department are involved in the review and interpretation of the assessment data. The graduate program coordinator is responsible for compiling the final report.

Describe the process for sharing and discussing assessment findings with program faculty: At faculty meetings, the graduate program coordinator shares the information from various assessments.

Program Improvements Based on Assessment

Based on data collected this year, what changes are being considered or planned for the program?: A change in curriculum was recently implemented with the addition to the core course CHE 5302 - Introduction to Scientific Engineering and Research. This course is designed to expose new graduate students to principles and practice common to research in science and

engineering, and accelerate student development towards independent and creative research prowess. The total number of student credit hours required for the PhD degree was reduced with the goal of aiding with recruitment, making our program more competitive with other programs that have reduced total credit hours. Changes in advising will help with time to graduation, positive student experience, and no errors in program requirements for students.

Based on this year's findings, what (if any) changes are planned for the assessment process?: No changes planned.

Program Improvements Made in the Last Year: Curriculum Improvements, Other Improvements

"Other" Improvements: Reduced student credit hours required for the PhD degree with the goal of aiding with recruitment, making our program more competitive with other programs that have reduced total credit hours.

Goals for the Coming Year: Add more CHE graduate level electives to the curriculum.

Update the CHE Graduate Program Handbook to clarify and update departmental graduation requirements.

Implement the decrease in total number of student credit hours required for the PhD degree.

Implement new advising strategy to help with time to graduation, positive student experience, and no errors in program requirements for students.

Is this Summary Report Complete?: Yes

List all individuals associated with this report preparation: Heather Fahlenkamp, Beth Kelly

Related Documents:

[2019 Chemical Engineering Graduate Program Exit Interviews.pdf](#)

Outcome: Depth in Education

Build upon and expand the student's undergraduate education by emphasizing depth in thermodynamics, transport phenomena, kinetics and mathematical modeling

Outcome Status: Active

Planned Assessment Year: 2016 - 2017, 2017 - 2018, 2018 - 2019

Outcome Type: Knowledge

Assessment Methods

Performance or Jury - Student performance in core courses on comprehensive exams, oral presentations, and course projects was evaluated by course instructors. (Active)

*** Learning Outcome Goal/Benchmark:** Students must make a grade of "B" or better. Any CHE course with a grade of "C" must be repeated at the next offering of the course. A grade of "C" in a second course will again result in a review of the student's progress. In all but the rarest cases, a second "C" in a CHE course (or a "D" or "F" in any course) will result in dismissal from the graduate program.

The core courses include:

CHE 5123 - Advanced Chemical Reaction Engineering

CHE 5213 - Selected Diffusional Unit Operations

CHE 5743 - Chemical Engineering Process Modeling

CHE 5843 - Principles of Chemical Engineering Thermodynamics

Timeline for Assessment: Each Semester

Survey - Student survey of instruction (Active)

*** Learning Outcome Goal/Benchmark:** Student feedback regarding learning experiences in the core courses.

The core courses include:

CHE 5123 - Advanced Chemical Reaction Engineering

CHE 5213 - Selected Diffusional Unit Operations

CHE 5743 - Chemical Engineering Process Modeling

CHE 5843 - Principles of Chemical Engineering Thermodynamics

Timeline for Assessment: Each Semester

Interviews - Exit interviews of graduates were conducted by the department head. (Active)

*** Learning Outcome Goal/Benchmark:** Student feedback regarding learning experiences in core courses.

The core courses include:

CHE 5123 - Advanced Chemical Reaction Engineering

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CHE 5213 - Selected Diffusional Unit Operations
CHE 5743 - Chemical Engineering Process Modeling
CHE 5843 - Principles of Chemical Engineering Thermodynamics
Timeline for Assessment: During the final semester for graduating students

Outcome: Applications of Chemical Engineering

Expand personal knowledge of the broad range of applications of chemical engineering

Outcome Status: Active

Planned Assessment Year: 2016 - 2017, 2017 - 2018, 2018 - 2019

Outcome Type: Knowledge

Assessment Methods

Survey - Student survey of instruction. (Active)

* **Learning Outcome Goal/Benchmark:** Student feedback regarding learning experiences in CHE 6010 - Chemical Engineering Seminar. All students must have a minimum of 6 credits (3 credits for those entering with a MS degree) prior to graduation.
Timeline for Assessment: Each Semester

Interviews - Exit interviews of graduates were conducted by the department head. (Active)

* **Learning Outcome Goal/Benchmark:** Student feedback regarding learning experiences in CHE 6010 - Chemical Engineering Seminar. All students must have a minimum of 6 credits (3 credits for those entering with a MS degree) prior to graduation.
Timeline for Assessment: During the final semester for graduating students

Performance or Jury - Student performance in CHE 6010 - Chemical Engineering Seminar was evaluated by course instructor. (Active)

* **Learning Outcome Goal/Benchmark:** All students must have a minimum of 6 credits (3 credits for those entering with a MS degree) prior to graduation. This course includes outside speakers for technical presentations related to the broad range of applications of chemical engineering and for professional development.
Timeline for Assessment: Each Semester

Outcome: Additional Knowledge Related to Chemical Engineering

Attain additional knowledge (breadth and/or depth) in topics related to chemical engineering

Outcome Status: Active

Planned Assessment Year: 2016 - 2017, 2017 - 2018, 2018 - 2019

Outcome Type: Knowledge

Assessment Methods

Performance or Jury - Student performance in elective courses on comprehensive exams and course projects was evaluated by course instructors. (Active)

* **Learning Outcome Goal/Benchmark:** All students must have a minimum of 15 credits (up to 6 credits for those entering with a MS degree) prior to graduation. Students complete graduate-approved elective courses related to the student's research project and/or career objectives.
Timeline for Assessment: Each Semester

Survey - Student survey of instruction (Active)

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*** Learning Outcome Goal/Benchmark:** Student feedback regarding learning experiences in graduate-approved elective courses. Students complete 15 credit hours (up to 6 credit hours for those entering with a MS degree) of graduate-approved elective courses related to the student's research project and/or career objectives.

Timeline for Assessment: Each Semester

Interviews - Exit interviews of graduates were conducted by the department head. (Active)

*** Learning Outcome Goal/Benchmark:** Student feedback regarding learning experiences in graduate-approved elective courses. Students complete 15 credit hours (up to 6 credit hours for those entering with a MS degree) of graduate-approved elective courses related to the student's research project and/or career objectives.

Timeline for Assessment: During the final semester for graduating students

Outcome: Define a Research Problem and Develop a Plan

Refine the ability to define a research problem and develop a plan for its solution.

Outcome Status: Active

Planned Assessment Year: 2016 - 2017, 2017 - 2018, 2018 - 2019

Outcome Type: Skills

Assessment Methods

Oral Presentation - Student performance on the oral presentation of the qualifying exam was evaluated by the advisory committee. (Active)

*** Learning Outcome Goal/Benchmark:** Students must pass the qualifying exam. The exam consists of (a) a written proposal regarding the student's thesis research project and (b) an oral defense of the proposal. The written proposal has to conform to National Science Foundation formatting requirements for text, length, bibliography and budget. Some students also enroll in grantsmanship courses and/or events offered at the college and/or university level.

Timeline for Assessment: After the student has completed requirements for the qualifying exam.

Analysis of Written Artifacts - Student performance on the written element of the qualifying exam was evaluated by the advisory committee. (Active)

*** Learning Outcome Goal/Benchmark:** Students must pass the qualifying exam. The exam consists of (a) a written proposal regarding the student's thesis research project and (b) an oral defense of the proposal. The written proposal has to conform to National Science Foundation formatting requirements for text, length, bibliography and budget. Some students also enroll in grantsmanship courses and/or events offered at the college and/or university level.

Timeline for Assessment: After the student has completed requirements for the qualifying exam.

Interviews - Exit interviews of graduates were conducted by the department head. (Active)

*** Learning Outcome Goal/Benchmark:** Student feedback regarding learning experiences from the qualifying exam. The exam consists of (a) a written proposal regarding the student's thesis research project and (b) an oral defense of the proposal. The written proposal has to conform to National Science Foundation formatting requirements for text, length, bibliography and budget. Some students also enroll in grantsmanship courses and/or events offered at the college and/or university level.

Timeline for Assessment: During the final semester for graduating students

Outcome: Conceive, Plan, Execute, Complete and Defend Research Work

Demonstrate the independence, initiative and ability to conceive, plan, execute, complete, and defend research work at the frontier of scientific and/or engineering knowledge.

Outcome Status: Active

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Planned Assessment Year: 2016 - 2017, 2017 - 2018, 2018 - 2019

Outcome Type: Skills

Assessment Methods

Oral Presentation - Student performance on the oral presentation for the dissertation was evaluated by the advisory committee. (Active)

* **Learning Outcome Goal/Benchmark:** Students must successfully complete and defend a dissertation, which includes a clear advance in the state of knowledge in the field of chemical engineering.

Timeline for Assessment: After the student has completed the research.

Review of Thesis/Dissertation/Creative Component - Student performance on the dissertation was evaluated by the advisory committee. (Active)

* **Learning Outcome Goal/Benchmark:** Students must successfully complete and defend a dissertation, which includes a clear advance in the state of knowledge in the field of chemical engineering.

Timeline for Assessment: After the student has completed the research.

Interviews - Exit interviews of graduates were conducted by the department head. (Active)

* **Learning Outcome Goal/Benchmark:** Student feedback regarding learning experiences in completion and defense of dissertation. Students must complete and defend a dissertation, which includes a clear advance in the state of knowledge in the field of chemical engineering.

Timeline for Assessment: During the final semester for graduating students

Outcome: Develop Communication Skills

Develop effective written and oral communication skills.

Outcome Status: Active

Planned Assessment Year: 2016 - 2017, 2017 - 2018, 2018 - 2019

Outcome Type: Skills

Assessment Methods

Analysis of Written Artifacts - Student performance on the written element of the qualifying exam was evaluated by the advisory committee. (Active)

* **Learning Outcome Goal/Benchmark:** Students must pass the qualifying exam.

Timeline for Assessment: After the student has completed the requirements for the qualifying exam.

Presentation/Performance - Deliver a formal presentation at a technical society meeting or a CHE seminar. (Active)

* **Learning Outcome Goal/Benchmark:** Students must present his/her findings in a national forum, such as the AIChE or ACS technical conferences, or in CHE 6010 - Chemical Engineering Seminar.

Timeline for Assessment: After the student has completed requirements for the qualifying exam and the research project.

Review of Thesis/Dissertation/Creative Component - Student performance on the written dissertation and oral defense was evaluated by the advisory committee. (Active)

* **Learning Outcome Goal/Benchmark:** Students must successfully complete a written dissertation and defend it before an advisory committee.

Timeline for Assessment: After the student has completed requirements for the qualifying exam and the research project.

Interviews - Exit interviews of graduates were conducted by the department head. (Active)

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*** Learning Outcome Goal/Benchmark:** Student feedback regarding learning experience of developing their written and oral communication skills. Students must complete a written component of the qualifying exam and a dissertation. Present and defend both orally to the advisory committee. Deliver a formal presentation at a technical society meeting or a CHE seminar. Some students also enroll in grantsmanship courses and/or events offered at the college and/or university level.

Timeline for Assessment: During the final semester for graduating students

Oral Presentation - Student performance on the oral presentation of the qualifying exam was evaluated by the advisory committee. (Active)

*** Learning Outcome Goal/Benchmark:** Students must pass the qualifying exam.

Timeline for Assessment: After the student has completed the requirements for the qualifying exam.

Analysis of Written Artifacts - Students must submit two manuscripts for publications in refereed journals (Active)

*** Learning Outcome Goal/Benchmark:** Students are expected to demonstrate a successful completion of research, as indicated by level of fruition and external acceptance. This may be accomplished by submitting: two manuscripts for publications in refereed journals or one refereed journal submission may be substituted for by two conference proceedings, or one patent application, or evidence for industrial process implementation.

Timeline for Assessment: After the student has completed requirements for the qualifying exam and the research project.