

Academic Assessment Plan

Doctor of Philosophy in Chemical Engineering (PhDChE)

AY2024-2025

Program Goals:

The program goal, or educational objective, of the Chemical Engineering graduate program is to prepare students for advanced roles in the profession through a combination of planned coursework and research activities so that graduates are equipped to address present and future challenges in such areas as research, teaching, management, and commercialization.

Student Learning Outcomes:

At the time of graduation, students obtain the following outcomes in support of the program's educational objective to prepare the students to enter the professional practice of engineering:

1. Critically analyze meaningful and technologically relevant data, and for thesis students, plan and safely conduct research.
2. Demonstrate proficiency in fundamental mathematics and chemical engineering problem solving.
3. Understand professional and ethical responsibility.
4. Develop and use effective written and oral communication skills.

Timeline for Data Collection and Analysis:

Data is collected by the Graduate Coordinator and/or Assistant to the Graduate Coordinator over the course of each semester as students achieve milestones (candidacy exam, thesis or dissertation defense) and analyzed at the end of the semester.

Method of Assessment and Desired Level of Student Achievement:

A summary of each outcome, its corresponding assessment method, and its desired outcome are presented in Table 1. In addition to the data listed in the table, for PhD students an increase in score for their evaluations on the candidacy exam vs. the dissertation defense are compared to determine improvement during the duration of the program.

Reporting of Results:

The results of the Student Learning Outcome assessment data are presented to the Graduate Program Committee on an annual basis (at either the end of the Spring semester or beginning of the Fall semester). At this meeting any deviations from the desired score level as well as overall trends for the past 5 years are discussed. At that time any changes or recommendations can be made for the next evaluation cycle. The results are also presented to the faculty of the Ralph E. Martin Department of Chemical Engineering at its annual fall faculty meeting, to be held August 13, 2025. In addition, the results are submitted as part of an annual report to the COE Dean.

Changes to the Degree Program – Planned or Considered: None

Changes to the Assessment Process – Planned or Considered:

The Graduate Program Committee is currently working on an alumni satisfaction survey to obtain a more long-term assessment of the student learning outcomes. It is planned that this will be implemented at the start of AY 2026-2027.

Table 1. Method of Assessment of Graduate Student Learning Outcomes

Learning Outcome	Assessment Tools	Desired Level of Student Achievement
1. Critically analyze meaningful and technologically relevant data, and for thesis students, plan and safely conduct research	Student performance on: <ul style="list-style-type: none">the candidacy exam (consisting of the student's presentation of the research proposal to the graduate committee);dissertation defenseannual safety quizzes (average score)	<ul style="list-style-type: none">score of good or better (≥ 2.0)score of good or better (≥ 2.0)>80% of student pass (score of >90%) within first 2 attempts
2. Demonstrate proficiency in fundamental mathematics and chemical engineering problem solving	Student performance on: <ul style="list-style-type: none">the candidacy exam (consisting of the student's presentation of the research proposal to the graduate committee);dissertation defensegraduate coursework (through GPA)	<ul style="list-style-type: none">score of good or better (≥ 2.0)score of good or better (≥ 2.0)average GPA >3.5
3. Understand professional and ethical responsibility	Student responses on: <ul style="list-style-type: none">Graduate exit interview questions	<ul style="list-style-type: none">score of ≥ 4.0 (out of 5.0)
4. Develop and use effective written and oral communication skills	Student performance on: <ul style="list-style-type: none">the candidacy exam (consisting of the student's presentation of the research proposal to the graduate committee);dissertation defense Student responses on: <ul style="list-style-type: none">Graduate exit interview questions	<ul style="list-style-type: none">score of good or better (≥ 2.0)score of good or better (≥ 2.0)score of ≥ 4.0 (out of 5.0)