Assessment: Assessment Plan

TEXAS TECH UNIVERSITY
Office *of the* Provost
Office *of* Planning & Assessment

Degree Program - AS - Chemistry (PHD)

CIP Code: 40.0501.00
Disciplinary Accrediting Body: American Chemical Society
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Assessment Coordinator: Michael Findlater
Modality: Face-to-Face

Student Learning Outcome: knowledge of chemical principles and research

To demonstrate advanced knowledge of chemical principles and current scientific research in chemistry.

Outcome Status: Active
Outcome Type: Student Learning
Start Date: 06/15/2015

Assessment Methods

Diagnostic examinations.
Before entering students register for classes they are given a series of nationally normalized examinations provided by the American Chemical Society. If deficiencies in the student's area of specialization are apparent, students are advised to take coursework or engage in guided independent study during their initial semester of graduate school. They are then given a second opportunity to pass the exam covering their area of specialization at the beginning of their second semester of study.

(Active)

Criterion: Two chances to pass at least one out of three diagnostic exams, where the “pass” rate is set by the individual divisions, but must be at least the 50th national percentile.

Exam - Cumulative examinations.
PhD students must take a series of written cumulative examinations in their specialty area covering a wide spectrum of material, with the purpose of assessing the student's ability to use the array of knowledge obtained from graduate coursework to analyze complex chemical problems. These exams must be passed in order to be admitted to candidacy. Faculty members will review cumulative examination policy in 2019.
(Active)

Criterion: Pass one exam after 6 chances in the first year; pass four exams total after 6 chances in the second year for a total of 12 chances in 2 years.

Seminar course.
Students must enroll in the CHEM 5101/5102 seminar courses for at least four semesters. Students enrolled in these classes must attend weekly divisional seminars presented by TTU faculty and students, and guest lecturers from other institutions, that cover topics in their area of specialization. Students also attend weekly departmental seminars that cover a wide range of topics and feature national and international speakers. More advanced students no longer enrolled in CHEM 5101/5102 are still expected to attend seminars, assessed by their research advisors via CHEM 7000 (research).

Degree Program - AS - Chemistry (PHD)

(Active)

Criterion: Grade of A or B in CHEM 5101/5102 and CHEM 7000.

Related Documents:
Organic Chemistry Seminar Evaluation Form - Student.doc
Organic Chemistry Seminar Evaluation Form - Faculty.doc

Miscellaneous.
Students also are encouraged to publish results of their research as journal articles and present their findings at professional scientific meetings. In addition, they demonstrate advanced knowledge in the research and future work examination, the PhD dissertation defense, and the literature seminar.
(Active)

Criterion: The research and future work examination, the PhD dissertation defense, and the literature seminar involve both a written and oral component, which must adhere to guidelines published in the graduate handbook. The determination is made by committee members, except in the case of the literature seminar, for which the determination is made by the set of faculty who attended the seminar.

Student Learning Outcome: conduct research

To be able to effectively conduct and design original, in-depth, scientific research in chemistry.

Outcome Status: Active
Outcome Type: Student Learning
Start Date: 06/15/2015

Assessment Methods

Research and future work examination.
The research and future work examination allows the student to orally discuss the research project in its early stages, via a 30-45 minute presentation and Q&A with the student's committee. This exam must be passed in order to be admitted to candidacy.
(Active)

Criterion: The research and future work examination involves both a written and oral component, which must adhere to guidelines published in the graduate handbook. The determination is made by committee members.

Ph.D. dissertation defense.
The PhD dissertation defense requirement again affords the opportunity to present the research project to the committee, this time at the end of the project. (Active)

Criterion: The Ph.D. dissertation defense involves both a written and oral component, which must adhere to guidelines published in the graduate handbook. The determination is made by committee members.

CHEM 7000 (research) course.
This learning outcome is assessed during the course of the research project by the research advisor's determination of the CHEM 7000 grade at the end of each semester.
(Active)

Criterion: Grade of A or B in CHEM 7000. Faculty are encouraged to assign grades of C or lower for unsatisfactory progress.

Student Learning Outcome: oral and written communication

To be able to effectively communicate, both orally and in writing, the results of new and advanced scientific research in chemistry.

Outcome Status: Active

Degree Program - AS - Chemistry (PHD)

Outcome Type: Student Learning
Start Date: 06/15/2015

Assessment Methods

Literature seminar.
The literature seminar is presented to the entire chemistry division to which the student belongs, as part of the weekly seminar series for that division and is graded by all of the faculty who attend the seminar. It must summarize recent research in the student's specialty area but be unrelated to his or her dissertation topic. Most divisions also require a written component to the literature seminar requirement.
(Active)

Criterion: The literature seminar must adhere to guidelines published in the graduate handbook. The determination is made by the set of faculty who attended the seminar.

Related Documents:
Organic Chemistry Seminar Evaluation Form - Faculty.doc
Organic Chemistry Seminar Evaluation Form - Student.doc

Research and future work examination.
The research and future work examination allows the student to discuss the research project in its early stages, via a written paper, followed by a 30-45 minute presentation and Q&A with the student's committee. This exam must be passed in order to be admitted to candidacy. (Active)

Criterion: The research and future work examination involves both a written and oral component, which must adhere to guidelines published in the graduate handbook. The determination is made by committee members.

Ph.D. dissertation defense.
The PhD dissertation defense requirement again affords the opportunity to present the research project to the committee, this time at the end of the project.
(Active)

Criterion: The Ph.D. dissertation defense must adhere to guidelines published in the graduate handbook. The determination is made by committee members.

Ph.D. dissertation.
Effective written communication is also thoroughly assessed in the student’s Ph.D. dissertation itself, by the Ph.D. committee members, at least one week prior to the oral dissertation defense. Suggestions for improving the written dissertation can continue even after the oral presentation.
(Active)

Criterion: The Ph.D. dissertation must adhere to guidelines published in the graduate handbook. The determination is made by committee members.

Scientific Writing Course. Students are encouraged to take a 3 credit hour special topics course, offered by the department, on scientific writing, with the specific goal of writing a research paper for submission to a scientific journal. (Active)

Criterion: Currently drafting a syllabus and identifying appropriate instructors to teach class. Students are always encouraged to register for appropriate writing courses, even if offered outside the chemistry department.
Schedule: Starting Spring 2021

Student Learning Outcome: safety and ethics

To demonstrate a working understanding of chemical research safety, ethics, and responsible conduct (RCR).

Outcome Status: Active
Outcome Type: Student Learning

Degree Program - AS - Chemistry (PHD)

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Laboratory safety certification.
All PhD students must be safety certified through the TTU Environmental Health and Safety unit, before joining a research group and entering their laboratories.
(Active)

Criterion: The EH&S on-line course on laboratory safety contains a quiz. 16 out of 20 questions (80%) have to be answered correctly to pass the course.

Research ethics course.
All PhD students are required to enroll in a for-credit course addressing scientific research ethics, CHEM 5104.
(Active)

Criterion: Learning success determined via short quizzes (20%), homework (40%), case studies (20%), and a presentation (20%).

Federal grant compliant RCR certification.
All PhD students who receive federal grant support must receive training and certification in the responsible conduct of research (RCR).

(Active)

Criterion: Successful completion of CHEM 5104, in addition to various training and guidance opportunities offered by the TTU Office of Research Integrity.