

## University of Rochester Doctoral Degree Program Assessment Plan

**A. Program title:** Chemistry

**B. Program degree:** PhD

**C. Program objectives and program learning outcomes:**

### **Program objective 1. Program will prepare students to contribute as original and creative scholars in their field**

Core knowledge, methods, and scholarship: Students will demonstrate comprehensive, in depth knowledge of the theories, methods, and scholarship in their area of Chemistry

Specialization knowledge, methods, and scholarship: Students will demonstrate comprehensive, in depth knowledge of the theories, methods and scholarship within specialized area(s) including the areas of Biological Chemistry, Inorganic Chemistry, Organic Chemistry, and Physical Chemistry

Creative synthesis/ Critical thinking: Students will creatively synthesize broad areas of theory and scholarship in generation of new ideas or insights; Students will be able to critically analyze works in their area of Chemistry

Research/ Methods: Students will conduct skillful research including gathering, processing, interpreting scholarship; Students will make considered choices in design of a research study; Students will precisely implement methods of analysis or investigation as part of research projects

Scholarship: Students will produce original, scholarly contributions in their field

Performance/ production/ showing: Students will effectively perform/ produce/ present original research

**Program objective 2. Program will prepare students to be successful and responsible professionals in their field**

Written communication: Students will convey ideas or arguments in clear, concise, well organized papers

Oral communication: Students will convey ideas in cogent, persuasive, and organized oral presentations and posters

Professional ethics: Students will appreciate the importance of and demonstrate a responsible, ethical manner in professional work

Teamwork: Students will demonstrate ability to work with others on projects, including sharing work involved in development of initial ideas and project plan, discussion of progress, and completion of work

Teaching: Students will present well organized workshops, laboratory activities and assignments that support student learning

Creativity/ innovation/ entrepreneurship: Students will demonstrate abilities in creativity/ innovation/ entrepreneurship through development of new inventions, patents, publications, productions, performances, public or private organizations

Global citizenship/ broad impact: Students will demonstrate appreciation for one's role as a member of an increasingly connected global society: Student work will demonstrate awareness of its social, economic, technical, or ethical impact

**Program objective 3. Program will prepare students to hold positions of leadership in academic, government, non-profit and industry organizations**

Leadership: Students will demonstrate leadership through positions held in scholarly and other professional activities

#### **D. Program assessment methods- direct methods**

The following methods will be implemented annually and for each doctoral degree candidate. Test results and faculty review forms for each method will be gathered in student file:

1. Score of 50<sup>th</sup> percentile or above on ACS exam. Exam is given in first week of entry to program. This written exam tests fundamental knowledge of physical, inorganic and organic chemistry. If student fails exam after 3 tries, student must take courses in these areas and obtain B grade in each.
2. Core courses in chemistry of at least 20 credits. B- grade or better in courses must be maintained.
3. Teaching requirement must be completed. Student receives feedback from instructor in charge of course.
4. Qualifying exam (written) covers undergraduate and graduate coursework. Exams are given in biological, physical, organic, inorganic, and nuclear chemistry. Students must obtain 4 pass points that are accumulated by passing any combination of exams.
5. Qualifying exam (oral)- faculty advisory committee tests students on general chemistry knowledge, and knowledge and skills needed to complete the proposed research project.
6. Third year seminar where student presents research project. Faculty can provide written or oral feedback.
7. Doctoral dissertation and oral defense by students will be reviewed by student's faculty committee. Data from review is submitted to the Graduate School Dean every year.
8. Awards, fellowships and other distinctions given by the program, University of Rochester, or external organizations.
9. Refereed journal and conference publications- reported by graduate student to program.

#### **E. Program assessment methods- indirect methods**

The following indirect methods will be implemented as noted:

1. Graduating Student Survey will be a web based survey distributed in 2012, 2013 and every other year after that by the UR College Director of Assessment. The survey will also include questions that ask students to rate program quality and factors related to learning for communication, leadership, research and teaching.

#### **F. Program assessment data review plan**

1. Formal progress review of first and fourth year students is completed by the graduate committee.

2. Data gathered on academic warning, qualifying exam results, and degrees conferred will be tabulated by the Graduate Studies Office and reviewed periodically by the DGS.
3. Graduate Student Survey data is reported to the DGS and graduate committee of the department.