Chemistry

Assessment Plan for the PhD Program

Program Learning Outcomes

The Chemistry PhD program prepares graduates who:

1. Have comprehensive and detailed knowledge of the factual information, theoretical principles, and methodological approaches in analytical, organic, inorganic, or physical chemistry. Have a working general understanding of basic principles in the other three sub-disciplines.

   **Assessment Methods:** Entrance examinations evaluate general understanding in all four sub-disciplines. Detailed knowledge in each student’s relevant is established and assessed in three core courses within that sub-discipline:
   - Analytical: (3) from CHEM 221A, 221B, 221C, 221D, 221E, and 221F
   - Inorganic: (3) from CHEM 231A, 231B, 231C, and 231D
   - Organic: (3) from CHEM 211A, 211B, 211C, 211D, and 211E
   - Physical: (3) from CHEM 201A, 201B, 201C, 201D, and 201E

2. Are able to (1) critically read, understand, and evaluate scholarly literature; (2) integrate and synthesize ideas; (3) identify and evaluate novel and relevant research questions; (4) develop appropriate and effective research strategies; (5) communicate clearly and effectively.

   **Assessment Methods:** Second Year Research Exam (SYRE) with both written and oral components; Qualifying Examination with written and oral components; thesis defense.

3. Are able to (1) apply appropriate, responsible, and ethical research methods; (2) evaluate, analyze, and interpret data; (3) develop and sustain data-based arguments; (4) convey findings clearly and effectively; (5) identify broader implications of findings; (6) produce publishable results.

   **Assessment Methods:** Orientation seminars, CHEM 401, and group meetings. Seminar presentations of both current literature and research results; dissertation defense.

4. Maintain progress towards a PhD within a reasonable time frame.

   **Assessment Methods:** Annual progress reports layout complete/incomplete degree requirements. Advancement to candidacy within 1 year of normative time; degree conferral within 1 year of normative time.

5. Are effective teachers.
Assessment Methods: Assignments and examinations in CHEM 401 and 402; student teaching evaluations during 3 quarters required TA service.

6. Are professionals capable of integrating socially and intellectually into an organization to which they will make valuable contributions.

Assessment Methods: Group meetings, professional development seminars, conference presentations, fellowship and grant awards, publications, reviewer activities, job placement.

7. Are satisfied graduates.

Assessment Methods: Exit interview.
Assessment Plan for the MS Program (Thesis)

Program Learning Outcomes

The Chemistry MS program prepares graduates who:

1. Have comprehensive and detailed knowledge of the factual information, theoretical principles, and methodological approaches in analytical, organic, inorganic, or physical chemistry. Have a working general understanding of basic principles in the other three sub-disciplines.
   
   **Assessment Methods:** Entrance examinations evaluate general understanding in all four sub-disciplines. Three core courses establish and evaluate detailed knowledge within a particular sub-discipline as follows:
   
   - Analytical: (3) from CHEM 221A, 221B, 221C, 221D, and 221E
   - Inorganic: CHEM 231A, 231B, and 231C
   - Organic: CHEM 211A, 211B, and 211C
   - Physical: (3) from CHEM 201A, 201B, 201C, 201D, and 201E

2. Are able to (1) critically read, understand, and evaluate scholarly literature; (2) integrate and synthesize ideas; (3) identify and evaluate novel and relevant research questions; (4) develop appropriate and effective research strategies; (5) communicate clearly and effectively.
   
   **Assessment Methods:** CHEM 301, Master's thesis defense

3. Are able to (1) apply appropriate, responsible, and ethical research methods; (2) evaluate, analyze, and interpret data; (3) develop and sustain data-based arguments; (4) convey findings clearly and effectively; (5) identify broader implications of findings; (6) produce publishable results.
   
   **Assessment Methods:** Orientation seminars and group meetings on ethics. Seminar presentations of both current literature and research results; Master’s thesis defense.

4. Maintain progress towards a Master’s degree within a reasonable time frame.
   
   **Assessment Methods:** Annual progress reports layout complete/incomplete degree requirements. Advancement to candidacy within 1 year of normative time; degree conferral within 1 year of normative time.

5. Are professionals capable of integrating socially and intellectually into an organization to which they will make valuable contributions.
   
   **Assessment Methods:** Group meetings, professional development seminars, conference presentations, fellowship and grant awards, publications, reviewer activities, job placement.
6. Are satisfied graduates.

*Assessment Methods:* Exit interview.
Assessment Plan for the MS Program (Coursework)

Program Learning Outcomes

The Chemistry MS program prepares graduates who:

1. Have comprehensive and detailed knowledge of the factual information, theoretical principles, and methodological approaches in analytical, organic, inorganic, or physical chemistry. Have a working general understanding of basic principles in the other three sub-disciplines.
   
   **Assessment Methods:** Entrance examinations evaluate general understanding in all four sub-disciplines. Three core courses establish and evaluate detailed knowledge within a particular sub-discipline.

2. Are able to (1) critically read, understand, and evaluate scholarly literature; (2) integrate and synthesize ideas; (3) communicate clearly and effectively.
   
   **Assessment Methods:** CHEM 401, comprehensive written examination.

3. Maintain progress towards a Masters degree within a reasonable time frame.
   
   **Assessment Methods:** Annual progress reports layout complete/incomplete degree requirements. Advancement to candidacy within 1 year of normative time; degree conferral within 1 year of normative time.

4. Are professionals capable of integrating socially and intellectually into an organization to which they will make valuable contributions.
   
   **Assessment Methods:** Group meetings, professional development seminars, conference presentations, fellowship and grant awards, publications, reviewer activities, job placement.

5. Are satisfied graduates.
   
   **Assessment Methods:** Exit interview.