

# **CHEMISTRY GRADUATE PROGRAM**

A Guide for Graduate Students

AY2013-2014

(Revised: August 2012; Approved November 6, 2012)



## CHEMISTRY GRADUATE PROGRAM

### 1. ADMISSION

In addition to the minimum requirements of UW's Graduate Student Regulations and Policies, [www.uwyo.edu/registrar/university\\_catalog/grad\\_students.html](http://www.uwyo.edu/registrar/university_catalog/grad_students.html), the department requires that a student has taken the following undergraduate courses: one year of general chemistry; one semester/quarter of quantitative analysis; one year of organic chemistry plus laboratory; one year of physical chemistry plus laboratory; one year of physics; and mathematics through multivariable calculus. As appropriate, one or more of these course requirements may be waived at the discretion of the department. All applicants must take the General Graduate Record (GRE) examination. The verbal and quantitative scores are evaluated.

Admission to the Graduate Program can be initiated only by the Graduate Admissions Committee upon receipt of a completed application.

### 2. ADVISEMENT OF GRADUATE STUDENTS

Prior to the student's first registration, he/she will meet with the Graduate Admissions Committee. The Committee will inform the student about registration at the University and give assistance in the selection of courses for the first semester. Typically, students will register for twelve (12) credit hours for their first semester; thereafter students may be asked to register for less than twelve (12) hours. The Graduate Admissions Committee will consist of one representative from each of three major field areas, who will be appointed by the Department Head.

An M.S. student must choose a research advisor by no later than the last month of his/her first semester, and a Ph.D. student within the first month of his/her second semester. It will then be the joint responsibility of the student and the research advisor to promptly determine faculty membership of the student's M.S. or Ph.D. committee in the form of a recommendation to the department head. The Head will then make a final recommendation to the Registrar.

***A graduate student shall not drop or withdraw from any course without the approval of his/her departmental advisor and the chair of the graduate committee.***

### 3. PROGRAMS OF COURSE WORK

An M.S. or Ph.D. program as discussed below can be approved only at a formal meeting of the student's M.S. or Ph.D. committee. Copies of the program must be circulated to the members of the committee at least one week prior to the meeting. Subsequent meetings of the M.S. or Ph.D. committee for discussion of the student's progress or lack thereof will be held only at the request of the Research Advisor, the Graduate

Committee, or the Department Head.

#### **4. M.S. PROGRAM**

The Department offers programs of study leading to the M.S. and M.S.T. degrees and cooperates with the M.S.N.S. degree program. The M.S. degree is offered routinely under Plan A. A student may petition the Graduate Committee for permission to pursue an M.S. degree under Plan B. (Plan A and B programs are defined in the Graduate Bulletin.

All UW graduate student requirements and regulations apply, except that the M.S. degree must be earned within a total time of four calendar years, or the student's degree program in Chemistry will be terminated.

##### **A. Program of Course Work**

A student planning to pursue an M.S. degree should inform the Graduate Admissions Committee of this intention and of any graduate course work he/she has taken at another institution. The Committee will help plan the first semester's course work and take measures to transfer appropriate previous graduate course work in accordance with UW graduate student regulations and departmental policy. During the first semester in residence, the student will choose a research advisor. The remainder of the student's program will then be planned by the student and his/her advisor and M.S. committee. The complete program must be filed with the Registrar at or before, registration for the second semester. In general, an M.S. degree program will be planned so that the student will complete all requirements for the degree within two calendar years with a total of 41 credit/hours.

A MS candidate must take a minimum of 5 lecture courses: Three (3) in the major area of study, as defined by divisional requirements, which may include core divisional courses plus any 5000 level lecture courses. In addition, any two (2) additional graduate level lecture courses (5000 and above) from 2 different areas outside your division in the Chemistry department (Inorganic, Organic, Analytical, Physical and Biological). Courses should be chosen in consultation with their advisor and approved by the graduate committee. See section 7 for specific division requirements.

##### **B. Other Regulations**

One departmental seminar is required on the student's research project. The student must register for CHEM 5000.

##### **C. Transfer from M.S. to Ph.D. Program**

A student in an M.S. program who is in good standing with a GPA greater than or equal

to 3.00 may petition to transfer into the Ph.D. program upon approval of his/her M.S. committee and recommendation of the Graduate Committee. No requirements for the Ph.D. program will be waived.

#### **D. Dismissal from the M.S. Program**

Dismissal from the M.S. program in Chemistry can only come as the result of a majority vote of the faculty at a regularly scheduled meeting. Recommendations for dismissal shall be by authority of the Graduate Committee. The only causes for dismissal shall be:

1. Unsatisfactory academic performance as defined in the University Graduate Student Regulations and Policies and/or failure to pass the final oral examination.
2. Unsatisfactory research performance as determined by the M.S. committee or failure to submit a satisfactory M.S. thesis (or Plan B paper).
3. Causes defined in University Regulations on student conduct.

### **5. PH.D. PROGRAM**

The Department offers programs of study leading to the Ph.D. degree in the areas of analytical, inorganic, organic, and physical chemistry. All UW graduate student regulations and requirements apply, and in addition, the student must successfully complete major field cumulative examination requirements before being permitted to take the preliminary examination.

#### **A. Program of Course Work**

A student planning to pursue a Ph.D. should inform the Graduate Admissions Committee of this intention and of any graduate course work he/she has taken at another institution. The Committee will help plan the first semester's course work and take measures to transfer appropriate previous graduate course work in accordance with UW graduate student regulations and departmental policy within their first semester. All students entering the program in the fall semester will choose a research advisor within the first month of their second semester. The remainder of the student's program will be planned by the student and his/her advisor and Ph.D. committee.

A Ph.D. candidate must take a total of seven (7) lecture courses: Four (4) in the major area of study, as defined by divisional requirements (see section 7), which may include core divisional courses plus any 5000 level lecture courses. In addition, any three (3) additional graduate level lecture courses (5000 and above) from 3 different areas

outside your division in the Chemistry department (Inorganic, Organic, Analytical, Physical and Biological). Courses should be chosen in consultation with their advisor and approved by the graduate committee. An additional 30 credits are obtained through dissertation research for a total of 72 credit/hours (at a minimum). Also, each division will designate a list of graduate level courses which all students majoring in that particular area must take (see Divisional Requirements). The student advisor and committee may approve a set of courses outside these guidelines (*e.g.*, inclusion of graduate level courses offered by other departments).

During the first year (fall and spring semesters), each student will register for up to six graduate courses. A student who enters in the spring semester will be held to this requirement too. In addition, each Ph.D. student must complete two of the out-of-division and two of the divisional course requirements. Students are encouraged to challenge any course by examination. See "Credit by Examination" in the General Bulletin.

A student in the Ph.D. program must satisfy the minimum GPA guidelines of the Registrar. Furthermore, at the end of the first academic year, on the basis of performance, a student will be (1) allowed to continue in the Ph.D. program if the GPA is greater than or equal to 3.00, (2) placed on academic probation if the GPA is less than 3.00, or (3) dismissed from the graduate program (see section 5-E). Action under (3) will be initiated by the Graduate Committee or the student's Ph.D. committee.

A student may not drop or withdraw from a course for reasons of poor performance. However, under extraordinary circumstances, a student may petition his/her advisor and the chair of the graduate committee for permission to make a course withdrawal or receive an "incomplete" grade for the course (see section 2).

## **B. Major Field Cumulative Examination Requirement**

The major field examination for Ph.D. students in Chemistry will be of the cumulative examination type. Each division will give eight (8) examinations during the normal academic year. Students must pass three out of eight (3/8) examinations before the end of their 3<sup>rd</sup> academic year semester in the program in order to successfully complete the Ph.D. major field requirement. Students must begin taking the cumulative examinations during their second semester in residence in succession (*i.e.*, no exam can be skipped), but may opt to take exams during their first semester in residence. Only passing examinations will be counted toward the eight total exams during the first semester in residence. The examination period will be three hours in length. The departmental Graduate Committee will publish the location, dates (normally the first Saturday of each month with the exception of holidays), times, and authors of the cumulative examinations at the beginning of each academic year. The general topic of the examination will be announced 10 days prior to the examination. *Cumulative examinations must be taken in the student's major field of study or in another division*

*with the written consent of their research advisor.* The announced format of the examination is determined by the division administering the examination; this includes its topic, the number of questions, whether preparation involving literature or textbook reading is required or suggested or not, etc. The pass or fail criterion for an examination is strictly determined by the division administering the examination. If a student is unable to take an examination at the regular time, he/she may be permitted to take the examination at an alternate time with permission of the Graduate Committee. A student with an unexcused absence from an examination will receive a failing grade. Students may elect to take only one examination on the published examination date (or two in which case both exams will count toward the total eight exams, either pass or fail).

Students who transfer into the Ph.D. program from either the Masters program in Chemistry or from another graduate program can petition to transfer cumulative examinations in order to meet the major field requirement. Upon consultation with the student's Ph.D. Advisory Committee and the appropriate division, the Chemistry Department Graduate Studies Committee will decide on the petition request.

### **C. Preliminary Examination**

Upon completion of the major field cumulative examination requirement, the student and the Ph.D. committee will make arrangements for him/her to take the preliminary examination for Ph.D. candidacy. The preliminary examination will have written and oral parts. The written part will be a research proposal **with a 50 page limit** (using standard NSF grant guidelines for format, *e.g.*, fonts, spacing etc.,; see [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=qpq](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=qpq)), and include: an abstract; an introduction that includes the objectives and significance of the research; statement of the problem or hypothesis(es); a discussion of previous work on the same or related problems; an approach to the problem; preliminary results, if any; experimental procedures; future/proposed work and literature references. The oral examination will focus on the proposal, but will also cover all related areas of chemical knowledge.

The subject of the proposal must be approved by the student's Ph.D. committee and should be on the student's actual Ph.D. research problem. The Ph.D. committee will have at least two full weeks to review the proposal before the oral defense by the student. If the student fails the examination, the committee will suggest how the proposal can be improved so that it can be resubmitted for a second defense. Students entering the program in the fall semester are required to complete the preliminary examination by March 15th in their fourth semester of residence at the University of Wyoming. (Students entering in the spring semester are required to complete the preliminary examination by November 15 in their fourth semester of residence.)

A student that passes the preliminary examination and subsequently decides to transfer

to a new research group (*i.e.*, new research advisor) must re-take the preliminary examination in the new area of research/project within a 12 month period of changing of groups.

#### **D. Seminars**

The student must complete two CHEM 5000 Graduate Seminar credits. The first credit will be given for a divisional or departmental seminar presentation or for an oral presentation at a regional or national research meeting. The second credit will be given for a final departmental seminar based on his/her Ph.D. dissertation research.

#### **E. Dismissal from the Ph.D. Program**

Dismissal from the Ph.D. program in Chemistry can come only as the result of a majority vote of the faculty at a regularly scheduled meeting. Recommendation for dismissal shall be by authority of the Graduate Committee.

Causes for dismissal are (No exceptions):

1. Academic reasons:
  - a. Academic suspension, which can result from a GPA of less than 3.0 in a 12 month period.
  - b. Failure to pass 3 major field cumulative examinations before the end of the 3<sup>rd</sup> academic year semester.
  - c. Failure to replace a grade of "D" (by re-taking the course) in any course taken while in the Ph.D. program (University regulations)
  - d. Failure to pass the preliminary examination on the second try.
  - e. Failure to pass the final oral examination (*i.e.*, fail the Ph.D. defense).
2. Unsatisfactory research performance as evaluated by the Ph.D. committee, his/her major professor (See section 6-C) or failure to submit a satisfactory Ph.D. dissertation.
3. Causes defined in University Regulations on student conduct.

#### **F. Duration of the Ph.D. Program**

In the event that the final dissertation defense is not scheduled within 5 years from the date the preliminary exam was successfully completed (*i.e.*, within 7 years of admission to the Ph.D. program), the student must reconvene with his/her graduate committee and request a time extension. Also, this time extension request must be submitted in writing to the Chemistry Department Graduate Committee for approval.

## 6. OTHER GUIDELINES AND REGULATIONS

### A. Graduate Resources

A copy of UW Graduate Student Regulations and Policies is included in this packet. This document defines all UW graduate student guidelines.

### B. Teaching Performance

Graduate assistants will be evaluated by both students and faculty supervisor(s) during each semester. Results of these evaluations are an important factor in decisions regarding continuation of financial support for teaching.

### C. Research Performance

A written report must be submitted to the Graduate Committee by the advisor at the end of the Fall, Spring and Summer semesters evaluating the research performance of a student to be either unsatisfactory or satisfactory. *An unsatisfactory rating from his/her research advisor for any two semesters within a period of 12 months (e.g., Fall-Spring-Summer) is grounds for dismissal from any degree program (See section 5-E.2).*

### D. Graduate Committee

Principal duties of the Graduate Committee are to advise the faculty on student petitions, recommendations from advisory committees, and general graduate policy.

### E. Outside Employment

So that the student can devote full time to courses and/or research, GAs and RAs are not to have other employment beyond a very limited amount of tutoring of chemistry students, which can contribute to his or her teaching skills and knowledge of chemistry.

## 7. DIVISIONAL REQUIREMENTS

- A. An M.S. candidate must take one three-hour graduate course in each of four areas, excluding special topics, tool courses 5130, 5320, 5560/4560, 5760 and research courses.
- B. All Ph.D. candidates must complete the major field cumulative examination requirement as defined in Section B of the Ph.D. program.

All Ph.D. candidates must complete course requirement as stated in Section 5A, "Program of Course Work".

Additional Ph.D. course requirements are listed below



### Analytical Chemistry

All analytical Ph.D. candidates must take 5250 (Advanced Chemical Instrumentation). The student must also take an additional three (3) 5000-level graduate courses from either the analytical chemistry division (including Special Topics in Analytical Chemistry) or from any other department, with proper approval of advisor and graduate committee.

### Inorganic Chemistry

The graduate level courses required for all inorganic Ph.D. candidates are any four courses selected from the following: 5110 (Inorganic Chemistry), 5115 (Descriptive Inorganic Chemistry), 5120 (Chemical Application of Symmetry and Group Theory), 5130 (Physical Methods of Inorganic Chemistry), 5140 (Organometallic Chemistry). Other 5000 level graduate inorganic "special topics" courses include 5160 (Bioinorganic Chemistry), Structure and Bonding, Inorganic Photochemistry and Inorganic Reaction Mechanisms.

### Organic Chemistry

There are three (3) graduate level courses required for all organic Ph.D. candidates: 5330 (Advanced Organic Chemistry I), 5340 (Synthetic Methods in Organic Chemistry), and 5350 (Advanced Organic Chemistry II). In addition, the student must also take one additional 5000-level graduate course from either the organic chemistry division or from any other department, with proper approval of advisor and graduate committee.

### Physical Chemistry

The graduate level course required for all physical Ph.D. candidates is one (1) of the offered 5500 level physical chemistry courses. The student must also take an additional three (3) 5000-level graduate courses from either the physical chemistry division (including Special Topics in Physical Chemistry) or from any other department, with proper approval of advisor and graduate committee. All physical Ph.D. candidates must also enroll in the Physical Group Chemistry seminar (5501) each semester.

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Student First and Last Name: \_\_\_\_\_

Degree being sought:      \_\_\_MS \_\_\_Ph.D.

By signing below, I hereby declare that I have read, understand and hereby accept the terms described in this document

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

*Detach and return the signed form to the Chemistry Department Main office by **Friday August 30, 2013***