



PennState
Eberly College
of Science

CHEMISTRY

**DEPARTMENT GUIDELINES
FOR GRADUATE STUDENTS**

Fall 2018

FALL 2018

CHEMISTRY DEPARTMENT

GUIDELINES

FOR GRADUATE STUDENTS

(Revised July 2018)

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Information or questions concerning these guidelines should be directed to:

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You are about to undertake one of the great adventures of your life. Graduate school can be one of the most rewarding, challenging, enriching, frustrating, enabling, terrifying, and exhilarating experiences that you will have. It will play a large role in molding you into the professional you will become and will likely change how you think in all of your life's endeavors. You will get out what you put in, and then some, as you navigate your way through the next several years.

In order to help you navigate the complexities of graduate school, we have developed this resource to provide guidance, or at least help you identify where to get it. Each level of the university has its own guidelines: the University, the Graduate School, the Eberly College of Science, and the Chemistry Department. In this document, we attempt to unify and present these guidelines in the context of how they might impact you and your choices. The rules sometimes change; please familiarize yourself with the current version of this document, which will be revised and distributed at the beginning of the fall semester each year.

Some of the key players in the graduate education hierarchy follow; each one serves a different role, and some of these individuals will likely have more impact on your lives than others.

Dr. Regina Vasilatos-Younken, Dean of the Graduate School
Responsible for developing policies and strategies for the University-wide graduate education enterprise

Dr. Sarah Ades, Associate Dean for Graduate Student Affairs, The Graduate School
(sea10@psu.edu)
Responsible for the University-level response to all graduate student problems or concerns; a resource primarily reserved for complex cases.

Dr. Aleksandra (Sesa) Slavkovic, Associate Dean for Graduate Education, Eberly College of Science
(abs12@psu.edu)
Responsible for developing strategies and policies for graduate education specific to the ECOS; aids in problem solving; sponsors ECOS-wide graduate student events

Dr. Scott Showalter, Graduate Program Advisor, Chemistry Department
(sas76@psu.edu)
Responsible for developing strategies and policies for graduate education specific to the Chemistry Department; problem solver for many Chemistry graduate student problems

Crista Spratt, Graduate Program Manager, Chemistry Department
(cus1246@psu.edu)
Responsible for implementing graduate student-related strategies and policies in the Chemistry Department; resource for all graduate student paperwork; repository of all forms, policy information, documents, etc.; assistant graduate student problem solver

Megan Kuhlman, Graduate Program Assistant, Chemistry Department
(mak902@psu.edu)
Responsible for many of the day-to-day operational aspects of the Chemistry Graduate program; repository for all forms, paperwork, deadline info, relevant documents, etc.

If you have a problem, concern, or question of any type relevant to your graduate education, you should start at the bottom of this hierarchy and work your way up. Someone along the way will be able to assist you.

In addition to the formal hierarchy reviewed above, there are other people here to help you maximize your professional and personal gains in graduate school:

Dr. John Dodd, Senior Graduate Advisor (jd@johndodd.us): Dr. Dodd is a Penn State Chemistry PhD alum who has recently completed a > 30-year career in the pharmaceutical industry, working at several venues both large and small, and hiring/managing over 100 scientists along the way. He has retired to the State College area, and has graciously volunteered his time and expertise in assisting you along your pathway through graduate school and into your post-graduate career. He is a font of useful information on job seeking in chemical industry, and he will work with you individually to tailor your approach and your CV in order to maximize your chances of obtaining the job that you want. Please email him to arrange a meeting time if you are interested.

The Chemistry Graduate Student Association (Chem GSA): A group of graduate students have coalesced to form a committee dedicated to improving your graduate student experience in several ways. They sponsor student mixers to facilitate student networking (it's easy to become isolated in your research group!), panels, workshops, seminars, etc. that are designed to inform you on activities related to job seeking in all venues, and they have initiated a peer-to-peer mentoring program. Please get involved – they need your support, and you will most likely gain more than you have to give! Just add their group on Facebook if you wish to stay up-to-date with their events (PSU Chemistry GSC).

The Current Board of the CHEM GSA is as follows:

President: Kate Lebold (kml5480@psu.edu)

Vice-President: Santana Cruz (ssc5164@psu.edu)

Secretary: Marissa Saladin (mus375@psu.edu)

Treasurer: Hannah Rose (hrr115@psu.edu)

Professional Development Chair: Pedro Rivera Pomales (pxr193@psu.edu)

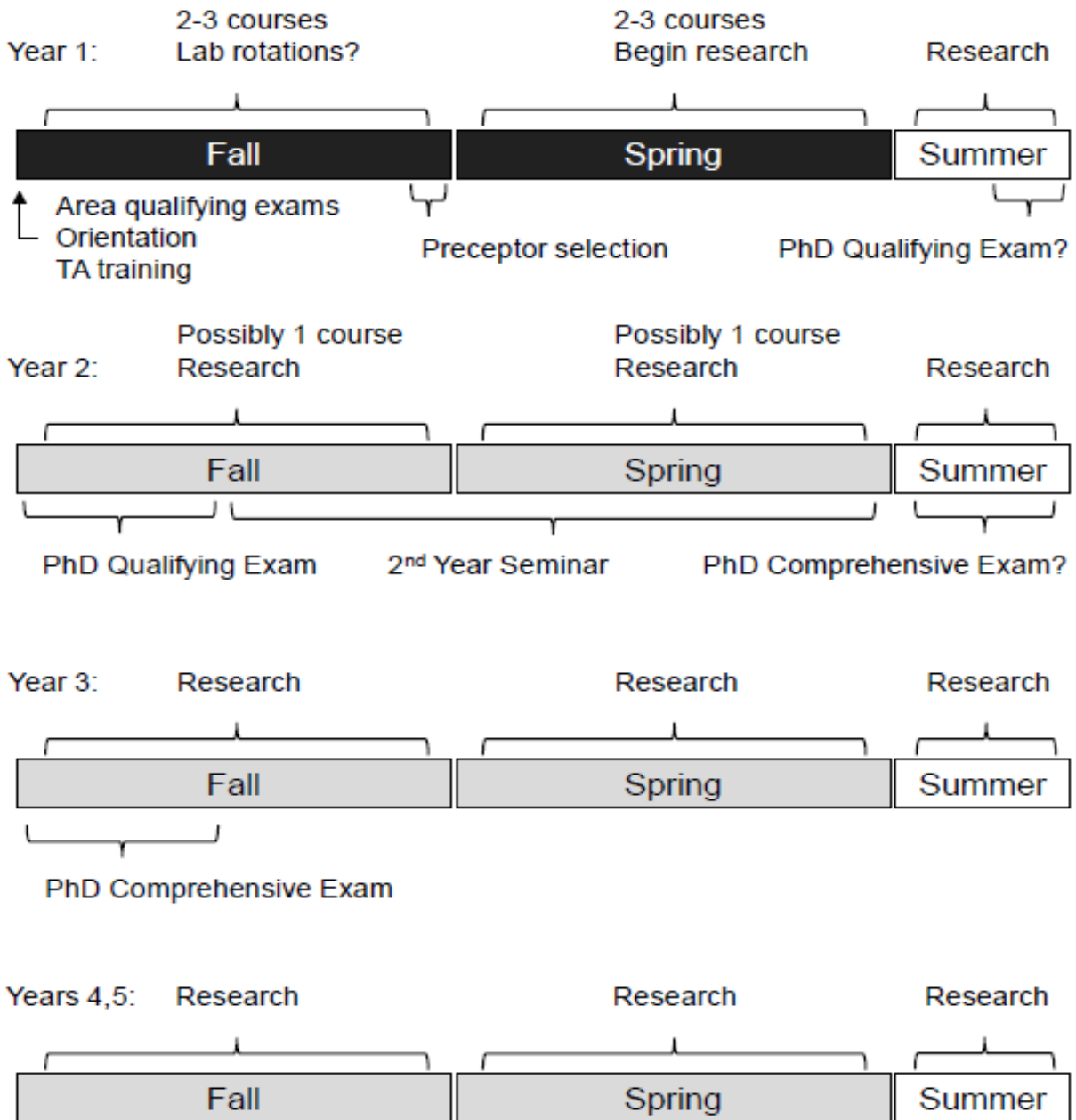
Outreach Chair: Alicia Altemose (asa5237@psu.edu)

External Liaison: Lily Mawby (llm78@psu.edu)

Staff Advisor: Crista Spratt (cus1246@psu.edu)

Faculty Advisor: Dr. Scott Showalter (sas76@psu.edu)

Timeline for Your PhD Graduate Studies



Some students will defend their PhD by the end of year 5.

Year 6+: Defend PhD; mandatory annual committee meeting until defense.

Likely Support: TA probable (Yr 2 if fellowship) TA or RA available Only RA available

FORMAL REQUIREMENTS, POLICIES AND PROCEDURES FOR ADVANCED DEGREES

A. UNIVERSITY-WIDE REQUIREMENTS

Requirements for advanced degrees, together with regulations of the Graduate School, are described in the publications:

- (1) *Graduate Degree Programs Bulletin*
- (2) *Thesis Guide*

These are available at the Graduate School office, 114 Kern Graduate Building or on the Graduate School web page (<http://www.gradsch.psu.edu/>). All graduate students are expected to assume full responsibility for knowing these requirements and procedures.

B. DEPARTMENT REQUIREMENTS

Candidates for advanced degrees in chemistry must meet the following requirements established by the Graduate Counseling and Awards Committee (GCAC) and approved by Chemistry Department graduate faculty. Please note that, in the course of your graduate career, you will be required to prepare and submit for grading/evaluation several documents, as described in detail below. Format requirements for these submissions are provided in this document. From time-to-time, minor changes (including number, length or format of written papers and proposals) may be introduced at the discretion of the (GCAC) and all students will be notified of these changes. It is your responsibility to follow the most current guidelines; any updates will be sent to your PSU e-mail account and are available in the Graduate Program Office.

1. Area and Writing Qualification Requirements

Demonstration of competency in the traditional disciplines of chemistry. Six qualifying exams will be used to evaluate your preparedness for our program; five of these exams are area qualifiers in the traditional disciplines of analytical, biological, inorganic, organic, and physical. In addition, there is a mathematics exam that accompanies the physical chemistry exam and is used to place students in the appropriate physical chemistry course. The qualifying requirement for certification as a Ph.D. candidate is that a student must demonstrate proficiency in **three areas of chemistry**. For certification as a M.S. candidate, proficiency is required in two areas. Proficiency may be demonstrated by either:

- a. Passing the qualifying examination upon entrance
- b. Obtaining a grade of "B" or better in a three-credit graduate course designated as a "qualifier". The courses that establish qualification will be designated by the GCAC. Coursework used to establish qualification must be completed during the first two semesters of enrollment.

The GCAC meets with each new graduate student after the area qualifying examinations are concluded in order to help plan a course schedule. Courses are chosen first to facilitate completion of the area qualification requirement and second to give the student advanced training in their area(s)

of interest. The Chemistry Department provides chemistry course syllabi for all the graduate and upper-level undergraduate courses that will be offered during the academic year.

Demonstration of competency in written and spoken English. Consistent with the best practices of our peer institutions in the United States, the Graduate School mandates that all Ph.D. candidates demonstrate competency in both written and spoken English before taking the Comprehensive Exam, although the format of the assessment is at the discretion of individual graduate programs. The chemistry graduate program uses the following criteria:

- a. Successful demonstration of competency in written English means that the Ph.D. candidate can communicate scientific information in a formal professional setting, such as in a peer-reviewed journal or in the format of a proposal for funding. To achieve this objective, students must first demonstrate that they are capable of effective narrative writing, including proper use of grammar and spelling, and command of an adequate vocabulary. The successful student will be able to write documents that are clear, concise, and logically organized.
- b. Successful demonstration of competency in spoken English means that the Ph.D. candidate can communicate scientific information in a formal professional setting, such as an academic seminar, a poster session, or as the instructor in a classroom. To achieve this objective, students must first demonstrate a vocabulary sufficient for informal conversation. Please note that our students are not expected to have perfect pronunciation and enunciation, but the successful student will speak English of sufficient quality for an attentive listener to follow the conversation and/or learn from a professional presentation.

Certification of area and English competency. The graduate program manager examines the transcript of each first-year student at the end of the Spring semester to review progress and will notify students of deficiencies. The Graduate Council requires a grade point average of 3.0 for admission to Ph.D. candidacy. Chemistry 602 (Supervised Experience in College Teaching) is not used in computing this average. Students who have not met the area qualifying requirement and the 3.0 GPA requirement by the end of their third semester of enrollment (\neq summer) cannot be admitted into full candidacy in the Ph.D. program. Students who do not correct a GPA deficiency by that time will be dropped from the Ph.D. program, but they may be given the opportunity to complete an M.S. degree (which itself has a 3.0 GPA requirement). If the M.S. degree is completed successfully, then the student can choose to be evaluated by their Ph.D. committee for continuation in the Ph.D. program.

English competency will be assessed in two stages. First, all students will receive instruction in technical writing and oral communication during the first year of Chemistry 500: Seminar in Chemistry. Specific learning objectives and assessment mechanisms are discussed separately in the syllabus. Second, the student's thesis committee will evaluate the written report and oral presentation delivered in the first year meeting, which serves as the Qualifying Examination as described below. The graduate program manager examines the transcript of each student to ensure that a "B" grade or higher was earned in both semesters of Chemistry 500 and reviews the first year committee report to certify English competency. Students who are still deemed to be deficient in one or both areas of communication will be referred to the GCAC to develop an individual remediation plan, in consultation with the student's thesis mentor.

2. Course Requirements

A Ph.D. candidate is required to take a minimum of five 3-credit courses that can count towards attainment of the degree. A list of fall and spring Chemistry Department courses that can be used to

satisfy this graduate credit requirement will be given to you during orientation. In addition, courses outside the Chemistry Department that can be used to satisfy the 5-course requirement will be included. Students can take ONE 400-level course without seeking the approval of the GCAC; however, note that Chemistry 430, 432, 450 and 452 cannot be used to satisfy program degree requirements. Courses labeled with the 497 designation are "special topics" whose content, and therefore suitability for satisfying the graduate credit requirement, can change over time. **Students who wish to take a second 400-level course must seek approval by petitioning the GCAC.** A student's thesis mentor or doctoral committee may also require additional specific courses.

All graduate students are required to enroll for 1 credit of Chemistry 500, Seminar in Chemistry, during each semester of their first and second years in residency. Detailed information concerning Chemistry 500 is provided in a separate syllabus and during orientation. Be sure to familiarize yourself with the guidelines.

Graduate students are permitted, even encouraged, to take courses outside of the Chemistry Department's offerings. However, there are some restrictions on such courses:

- a. All courses offered outside of the Chemistry Department that are being considered to fulfill the 5-course requirement must receive pre-approval from the GCAC; please contact the graduate program manager to submit your petition for approval. A syllabus should be provided with the request. Please note that the graduate program manager has a list of courses outside of the Chemistry Department that already have been pre-approved for graduate credit, so check there first. This list also can be found at: <https://chem.psu.edu/grad/graduate-program-files/graduate-course-information-grad-credit-and-qualifiers>
- b. If a student's tuition is being paid by a federally sponsored project, every course must have a direct benefit for the student's scientific/research growth. In addition, any outside course taken by a **post-comprehensive exam student, regardless of the funding source**, faces the same restrictions. Post-comp students may only "audit" (1) 3-credit course per semester.
- c. Any major deviation from a standard chemistry graduate student course portfolio is subject to approval by the GCAC; please submit a petition through the graduate program manager.

3. Safety Examination Requirement

Before beginning laboratory research, a student must pass the safety examination administered by the department's Safety Committee. Work in any laboratory is contingent upon this prerequisite, which is strictly enforced. Safety examinations will be offered during orientation. Arrangements for those students failing the exam will be made by the Chemistry Graduate Program Office.

4. Chemical Storage and Waste Management Requirements

All graduate students working in a lab are required to receive training on handling chemicals and chemical wastes. Individuals must be trained within 90 days of arriving at Penn State. This training is supplied through Penn State's Environmental Health and Safety Unit; details can be found on their web site: www.ehs.psu.edu, click on Training, then on Laboratory Safety and Laboratory Hazard Communication.

5. Professional Ethics Requirements

All graduate students at Penn State are required to receive training in professional ethics and research integrity as a foundational aspect of their education. Your Penn State peers in other graduate programs may fulfil this requirement through completion of "CITI" and "SARI" training, as did your senior colleagues in Chemistry; starting this year, you will not. Students in the Chemistry Graduate

Program fulfill this requirement through completion of the two first year semesters of Chemistry 500, with a minimum grade of “B” each semester, as described in the course syllabus received separately during orientation.

6. Teaching Requirement

All graduate students must serve as a teaching assistant for at least one semester, during which the student will register for 1 credit of Chemistry 602 and must obtain a “B” or better grade. This requirement must be met prior to scheduling the Comprehensive Exam. Exceptions to any aspect of this policy will be handled on a case-by-case basis by petition to the GCAC via the graduate program manager.

7. English Requirement for International Students to Serve as Teaching Assistants

All entering international students are required to take an American English Oral Communicative Proficiency Test. The test is administered by the University’s Linguistics and Applied Language Studies Department.

The oral proficiency test is given **only** at the beginning of the fall semester. Students are required to pre-register for the test. The test scores are available through the Chemistry Department Graduate Office.

- a. Those students who achieve a score of 250 (out of 300 possible) or above on the exam may be approved for teaching.
- b. Those students who score below 250 will be required to enroll and pass classes designated by the university’s Linguistics and Applied Language Studies Department. Students need to pass all courses with an “A”. **Completion of ESL 118G is mandatory before a student will be allowed to teach.**
- c. Students who are required to enroll in ESL courses must satisfy the requirements within the stated time limits:
 - i. ESL 115G – end of fourth semester
 - ii. ESL 116G – end of third semester
 - iii. ESL 117G – end of second semester
 - iv. ESL 118G – end of second semester

Students who fail to satisfy the requirements within the stated time frame will be **required** to enroll in ESL classes during the summer semester, with the possibility of being responsible for paying the tuition and fees. Note that these English proficiency requirements apply only to qualifying for teaching assistant opportunities. As a separate and independent matter, all students must demonstrate oral and written proficiency in English in order to take the Comprehensive Exam, as described above in Section B-1.

8. Preceptor Selection

The preceptor selection process works as follows: Students are required to talk to **at least three graduate faculty members** about their research and obtain their signatures on the preceptor signature form, which will be due the third week of November (the form will be distributed by the Chemistry Graduate Program Office to all students during orientation). You are encouraged to talk to as many faculty members as you wish, but you only need three signatures. The introductory talks

during orientation do not count as talking to a faculty member. From the list of all faculty members you've met with, choose the top **three** with whom you would like to work, list them on the sheet with their signatures, and turn the sheet in to the Graduate Program Office. This ranked list should express your preferences, and you should feel comfortable with the prospects of working in any of the faculty members' groups that you list.

LABORATORY ROTATION PROGRAM: We have a lab rotation program that offers students the opportunity to engage in short-term rotations in participating faculty laboratories during the summer prior to matriculation and during the fall semester of the first year in residence. You will receive a list of participating faculty during Orientation and the benefits of participation will be discussed during the early weeks of Chemistry 500. This program is informal at present, and you should contact directly those faculty members in whose labs you would like to work. Not all faculty can accept all requests, so please plan accordingly with 2nd and 3rd choices. Participation in the lab rotation program is not required, but it is strongly encouraged.

There are many exciting research opportunities in our department, so please remain flexible as to your top preceptor choices. Please keep in mind that you may choose a preceptor in another department (i.e. Materials Science and Engineering, Biochemistry and Molecular Biology, etc.). However, if you choose a faculty member outside the Chemistry Department as your primary preceptor, **they are expected to financially support your research until the completion of your Ph.D.** In this circumstance, the Chemistry Department cannot guarantee more than 2 semesters of post-1st-year TA support for you during the entire course of your Ph.D. degree. Note that there are no TA positions available over the summer. So, you will have to make sure that the faculty member can support you for most of your Ph.D. training. In addition, the Graduate School requires that you have a formal co-advisor from the Chemistry Department, so please make sure that you include this person on your Ph.D. committee. This Chemistry faculty co-advisor is not required to bear any financial responsibility for you. **Please notify the graduate program manager if you intend to pursue this option.** You will be responsible for completing all Chemistry Departmental requirements for the Ph.D. degree and ultimately you will obtain your Ph.D. in Chemistry.

During the preceptor matching process, the Chemistry Graduate Program Office staff will consult with the faculty and make the best possible student-mentor pairings. After the decisions have been made, you will be notified via email of your preceptor assignment and receive the Preceptor Acceptance form. This is not a process that students should fear. If you have held good-faith conversations with the faculty whose signatures appear on your form, and especially if you have conducted effective research rotations, then there should be very little chance of a surprise on the Preceptor Acceptance form.

Historically, the Chemistry Graduate Program has had an extremely high success rate placing students who have conscientiously engaged in identification of a thesis preceptor. Still, each year a small number of students will not succeed in finding a good match for their thesis training. Additional time is available, but with strict limitations designed to serve the best interest of our students. Unfortunately, students who are unable to select a preceptor by the end of their second semester are at risk of being removed from the program. These students will be permitted to stay in the program for the summer semester following their first academic year, during which time they will be considered self-supported students, to continue the search for a preceptor. If at the end of the summer semester the student is still unassigned to a research group, the student will be

removed from the Chemistry Graduate Program because of the inability to progress any further in their doctoral research.

9. Doctoral Committee Selection

- a. **Doctoral Committee.** Your doctoral committee is composed of your Ph.D. advisor(s), two faculty members from your major field of study, one faculty member from another “unit” (typically a department other than that of your advisor’s primary appointment), and one faculty member from another field (very often, this will be the same as the “outside of unit” member). All faculty participants must be members of the Graduate Faculty. (To verify if a faculty member is a Graduate Faculty Member, visit: (<https://secure.gradsch.psu.edu/gpms/>) This committee is formed after consultation with your research preceptor. The composition of this committee is made to enhance your graduate experience. The student and their preceptor will select a doctoral committee based upon the guidelines listed in the graduate Bulletin, (<http://bulletins.psu.edu/graduate/degree requirements/degreeReq1>).

The Committee as a whole is responsible for guiding and mentoring the academic program and monitoring the progress of a student throughout their graduate career. The closer the connection to these faculty members over the years, the more beneficial it will be to you when they are called upon to write recommendation letters to future employers.

PROCEDURE FOR SELECTING YOUR GRADUATE COMMITTEE:

Please consult with your Ph.D. advisor and identify two faculty members that are in your major field of study (broadly defined as "chemistry"). These faculty members can be within the Chemistry Department or from another department.

- (1) Complete the Preliminary Selection Form provided by the Chemistry Graduate Program Office. Please consult with your chosen faculty first. Your list will then be circulated to the faculty involved, asking for a decision. This Preliminary Selection Form will be returned to you with the accepts/declines when the faculty that you have chosen have made their decisions.
- (2) If a faculty member(s) **does not accept** your request, then you must identify new candidates for your Ph.D. committee. Please approach the faculty member directly and make your request. When you have the required two agreeable faculty members (in addition to your Ph.D. advisor), fill those names in and return the Preliminary Selection Form to the Graduate Program Office.
- (3) Identify a suitable "outside-of-the-unit" member for your committee. This individual always resides in a department other than the department of your Ph.D. advisor's main appointment. Contact this individual and ask them to serve on your committee.
- (4) Identify a suitable “outside-of-the-field” member for your committee. This individual always has a primary appointment outside the field of chemistry. In nearly all cases, the easiest solution is to identify a single faculty member who can serve as both the outside-of-the-unit and the outside-of-the-field member, although this is neither required nor always possible. If your thesis advisor has a primary appointment outside of the Department of Chemistry, please consult with the graduate program manager for guidance on fulfilling these two requirements.

- (5) As you prepare for your First Year Committee Meeting, the Chemistry Graduate Office will generate a Doctoral Committee Signature Form and provide it to you. Please obtain the signatures of all four of your committee members (your preceptor, two in your major field and one outside-of-the-field member) as your First Year Committee Meeting. Return the completed form to the graduate program assistant by the indicated deadline.
- b. In some circumstances, it may be necessary to change the composition of your Ph.D. committee. If you find yourself in this situation, please submit a petition to request the change to the graduate program manager. This petition should indicate the reason for the change. If the reason is anything other than a change in the availability of a committee member, the GCAC may be asked to evaluate the request. Any change to the committee, substitution of committee members, or participation by committee members at a distance must follow university guidelines. All committee members, former and new, must be notified of the changes. The graduate program manager will submit the appropriate paperwork to the Graduate School on your behalf.

10. First-Year Committee Meeting/Report Requirement

Each student is required to meet with his/her newly established doctoral committee as a group. Along with the written report described here, this meeting constitutes the Qualifying Examination mandated for progress to full Ph.D. Candidacy at the Pennsylvania State University. Students must meet with their committee between July 1st and the last working day of September following their first two semesters in the Chemistry Graduate Program. This meeting date must be given to the graduate program assistant no later than the last working day of June. Two weeks prior to this meeting, a short written report (maximum five 1.5-spaced pages, all-inclusive; full-justified 1" margins, 12-point font) outlining preliminary results and plans for the initial stages of the student's thesis research must be submitted to the graduate program assistant for formatting review; only then is the student permitted to distribute the paper to the committee. The student's written report must be distributed to the committee a minimum of one week prior to the meeting. The committee will evaluate both the report and presentation and provide feedback to the preceptor, who is solely tasked with assigning the final grade as it pertains to the second-year Chemistry 500 grade. Students are responsible for scheduling the committee meeting, obtaining a meeting room through their assigned research staff assistant, and preparing a 20 – 30 minute oral presentation to the committee, followed by a question-and-answer session. The 1st year committee grade sheets and report must be completed and returned to the Graduate Program Office before the end of September in the second year of enrollment. Requests for an extension must be approved by the GCAC. As established by the University Graduate Council, a two-thirds majority of the committee must concur that the student has passed the examination in partial fulfillment of the requirements for passage to Ph.D. candidacy. If the student does not meet this requirement, the committee will recommend a remedy, or possibly may reach out to the graduate program advisor in order to resolve the identified deficiency(s). The 1st year committee grade sheet can be found at <https://chem.psu.edu/grad/graduate-program-files/1st-year-meeting-candidacy>

11. Seminar Requirements

Two seminars are required of every student.

- a. The first seminar is part of your Chemistry 500 requirement. It must be presented during the second year in residence and prior to taking the Comprehensive Exam. This seminar is given in one of the area seminar series, so please sign up for a time slot in a specific series (i.e., analytical, physical, inorganic, organic, biochemistry). A written report must be prepared as a part of the overall requirement. See the Chemistry 500 policy document for additional information.
- b. The second seminar will sum up the research that you have performed during your graduate career. The seminar is open to the public and constitutes the first part of the Thesis Defense (see Section 14).

12. Comprehensive Examination Requirement

A Ph.D. candidate may take the Comprehensive Examination after meeting all of the requirements described to this point in the guidelines. The Comprehensive Examination must be scheduled **at least three weeks** in advance through the Chemistry Department Graduate Program Office. When you are ready to schedule, submit the Comprehensive Exam Request Form found here: <http://sites.psu.edu/gradchemfinaldefense/comportal-exam/>

The Comprehensive Examination should be taken within a student's first **five semesters** of enrollment (not including summers) or within one semester after receiving a Penn State M.S. degree in Chemistry (see Section 17 for details). Students who do not take the Comprehensive Examination within the prescribed time period must petition the GCAC before the end of the first five semesters (excluding summers) of enrollment in order to request an extension. Petitions must include a reason for the delay and must be accompanied by a detailed letter of support/explanation from the thesis preceptor. Whereas there are many reasons to seek such a delay, not all carry the same weight and thus approval will not be automatic. **In the past, requests based upon some variation of the theme, "I haven't accomplished enough yet" were not approved, even when they were accompanied by the strong backing of the thesis preceptor. This policy will continue into the future.**

The doctoral committee administers the Comprehensive Examination. During the examination, the committee will review the candidate's progress. The committee may question the candidate on any topic relevant to obtaining a Ph.D. in Chemistry. To provide a framework for the examination, the candidate is required to:

- a. Prepare and distribute to the committee at least **one week** in advance a **research report and description of future plans (i.e., a research proposal covering your planned work)** of not more than 10 pages (excluding references). This document should include (i) a brief Abstract (< 200 words), (ii) a Background and Significance section, (iii) a detailed description of Research Accomplishments to date, (iv) proposed plans for Future Work, and (v) a Reference section (not included in the page limit). The candidate should be prepared to provide a brief synopsis (20 – 30 minutes) of this report in the form of an oral presentation.
- b. Prepare and distribute an **original research proposal** to the committee at least **one week** in advance. The proposal may be on any chemical (or chemically related) topic except that it may **not** be directly related to the candidate's thesis research. This "outside topic" proposal should also be no more than 10 pages in length. The candidate should be prepared to present a brief (20 – 30 minute) oral presentation on the proposal.

Both of these reports should adhere to the following format: single-spaced, 12-pt font with 1" full-justified margins. The page limit includes all figures, graphics, etc., but does not include references. References should be presented at the end of the document in standard ACS format.

The format of the comprehensive examination typically will follow this sequence: Immediately prior to the examination, the committee will meet in the absence of the student in order to discuss issues related to the student's exam. The committee will then choose the sequence of presentation for the two topics. Questioning will generally be related to the specifics of the topics presented. In addition, open questions used to judge the candidate's general background knowledge in areas the committee feels appropriately related to the student's course of research and study may be included. Following the questioning, the candidate will be asked to leave the room briefly while the committee discusses their performance. The candidate will then be called back to the committee to be informed of its decision (pass or fail) and to discuss the committee's perceptions of the candidate's areas of strengths and weakness and its recommendations for future scientific growth.

In the event that a student fails one or both sections of the Comprehensive Exam, the committee will recommend further action; there are checkboxes on the official Graduate School form that indicate "passed", "failed, retake", or "failed, no retake". If one or both portions of the exam must be re-taken, the committee will set a date for completion of the requirement. Any retake exams need to be completed by the end of the subsequent semester or earlier per the committee's discretion. The formal Comprehensive Exam paperwork must be completed and returned to the Chemistry Graduate Program Office regardless of the outcome of the exam. If the committee decides that the failed exam may not be retaken, then the student will be terminated from the Chemistry Ph.D. program (see Section 23 for details). In this latter circumstance, the student's Ph.D. committee may recommend the option of completing a terminal M.S. degree.

13. 5th year PhD Committee Meeting

All graduate students are required to meet with the graduate program manager at the end of their 5th year in residence if a final thesis defense is not already scheduled. This meeting is intended to facilitate degree completion and help students find answers to any questions they may have at this stage of their training. In order to encourage candor, the student's thesis mentor will not be present for this initial meeting. However, at the student's discretion, the graduate program advisor may be asked to attend. This meeting will involve a discussion of the format and purpose for a 5th year meeting with their PhD committee. The purpose of the 5th year meeting with the PhD committee is to collectively plan a satisfactory end-game for each student's Ph.D. studies with input from the student, their advisor, and the other committee members. If the student does not intend to defend their Ph.D. by the end of the summer following the fifth year in residence, the 5th year meeting must be held by the last working day in September at the start of the student's 6th year. The committee and student must complete the Report of Committee Meeting form (provided by the Chemistry Graduate Program Office) and return it to the graduate program assistant following the 5th year meeting.

14. Final Thesis Defense Requirements

The final thesis examination must be scheduled via the Chemistry Graduate Program Office **three weeks in advance**. When you are prepared to schedule your Final Defense, please submit the Exam Request Form found here: <http://sites.psu.edu/gradchemfinaldefense/phd-final-defense/>

- a. Each member of the doctoral committee is to be given a copy of the thesis **at least two weeks in advance** of the defense.

- b. The defense begins with a seminar that is open to the public.
- c. Following the public presentation, the doctoral committee questions the candidate in a closed-door examination.

Please note the following important deadlines: (1) The Final Thesis Defense must be completed within **6 years** of passing the Oral Comprehensive Examination. If you fail to do so, the Graduate School requires you to take and pass the Oral Comprehensive Examination again. (2) There must be at least a **3-month gap** between passing the Oral Comprehensive Examination and scheduling the Final Thesis Defense. (3) The final defense must occur within **8 years** of the date of Candidacy.

15. Thesis Requirement

In addition to the Graduate School requirements, described in the *Thesis Information Bulletin* (<http://www.gradsch.psu.edu/current/thesis.html>), the Ph.D. and Masters candidate are expected to furnish their preceptor with one bound, high-quality copy of the thesis.

16. Exit Interview

We would like to hear what you have to say! The department is interested in learning where you are going next and how you prepared yourself to get there. We also would love to know how we can improve the program! Your opinions are valued and do matter. Please complete an Exit Interview Survey to inform us. <http://sites.psu.edu/gradchemfinaldefense/department-exit-interview/>

17. M.S. Degree Requirements

The decision to obtain an M.S. degree may originate with the student, the student's preceptor, or their Ph.D. committee. Graduate students may decide to change their official status from Ph.D. candidate to M.S. candidate if they decide that an M.S. degree better serves their career goals. This change requires official paperwork, and should be discussed first with your preceptor. In rare circumstances, a discussion with the graduate program advisor can be substituted. Once you and your preceptor agree on an acceptable M.S. plan, please inform the graduate program manager, who will process the paperwork with the Graduate School for you.

Graduate students who are not making satisfactory progress towards the Ph.D. degree in the judgment of the student's preceptor or their Ph.D. committee will be notified that they are at risk of being terminated from the Ph.D. program. Students in this circumstance may be asked to complete an M.S. degree as a method of evaluating whether they should remain on track for the Ph.D. degree. Successful defense of the M.S. degree, in either circumstance, includes meeting all of the requirements for this degree as detailed in the Graduate Bulletin. These requirements include:

- (a) 30 graduate credits, at least 18 of which are at the 500-level or above
 - (b) A minimum GPA of 3.00 for work done at the Pennsylvania State University
 - (c) Passing a thesis examination
- a. In addition to the University requirements listed above, the Chemistry Department has a set of requirements that must be met:
- (a) The M.S. candidate must qualify in at least two areas.
 - (b) The M.S. candidate must complete five graduate-level courses as part of the 30 required units.

(c) The M.S. candidate must successfully complete four semesters of Chemistry 500

(d) The M.S. thesis examination committee must consist of at least three members of the graduate faculty, including the thesis advisor.

(e) The M.S. thesis must be defended successfully **within 1 year** of the date of the request to switch to the M.S. degree.

(f) A mandatory departmental signature page will be generated by the Chemistry Graduate Program Office for the student to distribute to their committee members. You must return the completed M.S. signature page to the graduate program assistant prior to participating in their M.S. defense.

- b. Students who pass their M.S. defense en route to a Ph.D. but who still have not yet passed their Comprehensive Exam must do so within **one semester (or summer) following the semester (or summer) of their M.S. defense** in order to remain on the Ph.D. track. A student in this situation may consolidate the two defenses (i.e., M.S. and Comprehensive Exam) by using the M.S. defense as the research report part of the Comprehensive Exam, provided that (1) they **schedule the Comprehensive Exam before the M.S. defense**, and (2) the **student's Ph.D. committee** administers the M.S. exam. Students should work closely with the graduate program manager to ensure that all required paperwork associated with these exams is processed in a smooth and timely manner. In addition, students are permitted to include the Comprehensive Exam original research proposal defense at their M.S. defense if they so choose, thus completing both parts of the Comprehensive Exam during the M.S. defense. Otherwise, the student must schedule a second meeting of their Ph.D. committee and defend their original research proposal in order to complete their Comprehensive Exam. In either circumstance, the time limit stated above (one semester/summer past the M.S. defense semester) holds for completing all of the Comprehensive Exam requirements.

Please be aware that a student's Ph.D. study program may be terminated for cause at any time during their graduate career (see Section **23** below), but that action is completely independent of any request to defend an M.S. degree. In this rare circumstance, the official University procedures detailed in Section **23** must be followed.

18. Leave Policy

Chemistry graduate students are expected to maintain continuous enrollment during their time in the graduate program. This is especially important for students who have completed their Comprehensive Exam. That said, we recognize that circumstances do arise under which a student's best interest is served through a leave of absence. Under normal circumstances, leaves of absence will only be considered for reasons such as medical need, personal emergencies, and military service. Students who would like to consider a leave of absence are strongly encouraged to discuss the idea with their advisor, the graduate program manager, and the graduate program advisor to determine if a leave is the appropriate course of action. Any leave of absence will need to be requested in writing (submitted to the graduate program manager) and if approved, will be considered for up to a one year term. In the event of a medical situation that requires a leave of greater than one year, the case will be evaluated individually by the graduate program advisor. Students on leave will be required to notify the Chemistry Graduate Office of their return six weeks prior to the semester in which they plan to return. This requirement is necessary in order for both the advisor and the Chemistry Graduate Office to care for all necessary administrative

tasks ahead of the student's return. Should the term of one year pass and the student does not correspond with the program regarding a return, the student will be formally removed from the Chemistry Graduate Program.

19. Withdrawing from the Program

Students electing to withdraw from the graduate program are permitted to do so. Such a decision should be made through consultation with their advisor, graduate program manager, and, if desired by the student, the graduate program advisor. Often, a plan can be developed that will allow students who otherwise would withdraw to complete a M.S. degree instead, as described in Section 17. When a final decision to withdraw from the program is made, the student needs to submit their desire to withdraw in writing to the graduate program manager, who will then work closely with the student to ensure all necessary paperwork is filed with the University Registrar and the Graduate School. Students electing to withdraw from the program will have up to one year to return to the program. They will be expected to notify the Chemistry Graduate Office of their return six weeks prior to the semester in which they plan to return in order for both the advisor and the Chemistry Graduate Office to care for all necessary administrative tasks. Should the term of one year pass and the student does not correspond with the program regarding the intent to return, the student will be removed from the Chemistry Graduate Program.

FURTHER USEFUL INFORMATION

20. Productive and Rewarding Graduate Student-Faculty Advisor Relationships

The quality of your graduate experience, and the eventual professional career onto which this experience propels you, are strongly influenced by the relationship that you have with your Ph.D. advisor. The foundation of any good relationship is effective two-way communication, leading to a shared acknowledgment of expectations, responsibilities, and corrective measures that may become necessary. In order to set you and your advisor on a beneficial course from the outset, we offer a set of suggestions (for both sides) that hopefully will minimize unrewarding diversions. It is highly recommended that you discuss the themes reviewed in this section with potential advisors *before* you join a research group, or, at the very least, soon after joining a group. But first...

Students, please realize:

- (1) Admission to graduate school only guarantees an opportunity, not an outcome.
- (2) It is your responsibility to ask enough questions so you can make informed decisions.
- (3) There will be tough times – be prepared.

Faculty, please realize:

- (1) You have an overriding responsibility to train your students, not just extract work product from them.
- (2) You have a responsibility to clearly establish expectations and provide constructive feedback.
- (3) You do not "own" your students' time – they have obligations outside of lab, and they are responsible for setting their priorities.
- (4) You are in an asymmetrical power relationship with your students – please be mindful of this.

Expectations for Faculty:

- (1) Ensure that the lab culture is welcoming to all students and completely free of any "hazing" (or worse, harassment).
- (2) Be accessible to your students! Find out what each student wants/expects with regard to face time with you, and try to deliver. If you will be absent for long stretches of time, make contact arrangements for your students in advance.
- (3) Be prepared to set clear goals for research work.
- (4) Discuss explicitly your expectations for work hours, vacations, emergency time off, sick days, etc.
- (5) Discuss all "ownership" issues with respect to authorship, collaborations, patents, etc.
- (6) You have an obligation to help your students realize their career goals; find out what these goals are, and think about what you can do to help your students achieve them.

Expectations for Students:

- (1) Take all aspects of your graduate experience seriously! Faculty are willing to invest a lot of time and money in you, and they expect you to perform.
- (2) You are an adult; you are responsible for your future. Be proactive in seeking out and identifying opportunities to help you advance your career, and/or establish life after graduate school.
- (3) Make sure that you are well informed on the up-to-date policies in our Department and also the policies authored by the Graduate School – read these policy documents, and the revised version that comes out every year.
- (4) Work on your communication skills (written and verbal) at every opportunity.
- (5) If problems arise, be aware of the avenues available to you to seek resolution. **Don't let bad situations fester!**

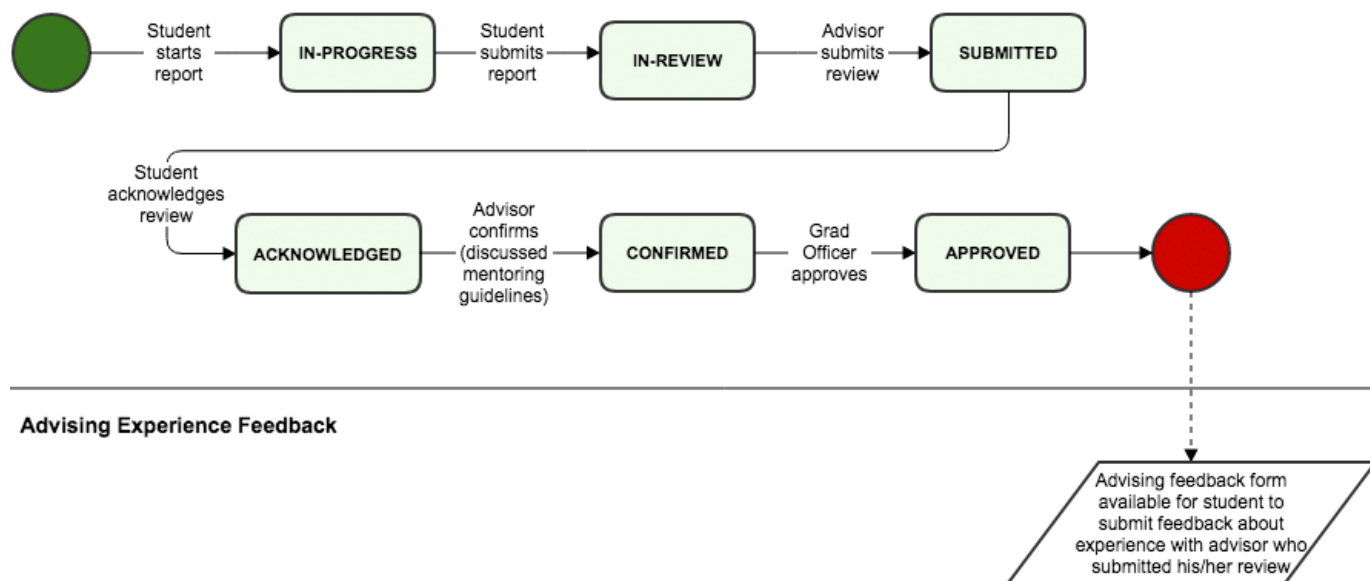
21. Yearly Graduate Student Evaluations

All graduate students in the Eberly College of Science must complete a Graduate Student Annual Report (GSAR) in partnership with their preceptor, using the GSAR application portal web interface: https://apps.science.psu.edu/grad_activity. Instructions for the student may be found in the following guide: <https://sites.psu.edu/scienceit/files/2018/05/GSAR-Student-Guide-23uc3zo.pdf> . The GSAR interface is open all year, with the exception of a brief transition period each August, and students are encouraged to enter data as they become available. While this system will look complex at first glance, it is actually a straight forward and helpful interface. By the time you are

ready to graduate, the GSAR system will be able to generate a nearly complete CV for you if you have used it correctly.

All graduate students and their faculty mentors will receive emails in the early summer reminding them of the requirement to complete the GSAR. **Nevertheless, it is the student's responsibility to initiate the process and to work with the preceptor to schedule the advising meeting that is necessary to complete the process.** The workflow for the GSAR system is summarized below:

Student Evaluation Process



The GSAR template contains a section that allows the student and the preceptor to express their concrete goals/expectations for the student's work during the coming year. This information can be exceedingly important in (a) providing a metric for future evaluations, and (b) defining a research endpoint towards the latter stages of a student's Ph.D. training. Please make sure that you take advantage of this opportunity as your Ph.D. studies enter their final stages. Please note that the Chemistry Graduate Program currently does not require annual Ph.D. committee meetings past the Comprehensive Exam. However, either the student or the preceptor can request a full Ph.D. committee meeting to discuss the evaluation, or as a concrete step to keep the student on track for timely degree completion.

The GSAR must be completed by July 31 of each year. In early August the graduate program advisor will review and approve or return each GSAR and notify the graduate program director of each student's status. Compliance with the GSAR requirement will be enforced by the Chemistry Graduate Program Office. If a student's report is not approved, or has not been completed, the graduate program assistant will reach out to the student. Any student who has not completed the GSAR process by the first day of the fall academic semester will be ineligible to receive departmental travel awards or continuing research awards until the deficiency in the GSAR is addressed.

22. Financial Support

- a. Students in good standing with the Chemistry Graduate Program will generally be provided with stipend support for the first five years of their Ph.D. training. Funding during the first two semesters of enrollment is provided by the Chemistry Department typically through a Teaching Assistantship (TA) or through an individual fellowship from the University or from an outside source. Funding beyond the first two semesters can come from either Teaching Assistantships or Research Assistantships (RA) through individual faculty members, so students are expected to be proactive about discussing whether funding will come from a TA or RA assignment each semester for the remainder of their academic program. Some students will wish to apply for external fellowship support, which can be an excellent professional development opportunity whether funding is secured or not. If you are interested in applying for fellowship support, please speak with your thesis preceptor (or with the graduate program director prior to preceptor selection). Please note that, other than wanting to have a clear expectation of when you may be supported by TA, RA, or fellowship, the source of your funding should not be a major concern during the course of your Ph.D. training. If you feel that funding pressure is being applied inappropriately, such as by leveraging it as being conditioned upon research productivity, please schedule an appointment with the graduate program director.

- b. As per policies agreed upon by our Chemistry Graduate Faculty, Chemistry Department policy limits financial support as a TA from departmental funds to the first four semesters of graduate study for M.S. degree candidates and to the first **ten semesters of graduate study for Ph.D. degree candidates**. Financial support beyond these periods should be obtained from other funds (e.g., research assistantship funded from a faculty member's research grant). Beyond the four semester and ten semester limits for M.S. and Ph.D. students, respectively, your Ph.D. advisor can make a request to the Chemistry Graduate Program Office for additional TA support. While there can be extenuating circumstances that merit extension of TA-line support, these are generally rare and approval is far from guaranteed. This written request, **signed by both you and your preceptor**, should be submitted to the graduate program manager and may be evaluated by the graduate program advisor or the full GCAC at their discretion. The request should describe (a) precisely what you still need to accomplish to be awarded a Ph.D. degree, and (b) when you will be done with this work and can defend your Ph.D. thesis. A 6th-year TA request that describes a plan with a Ph.D. defense date by the end of the first semester of the student's 6th year will be given serious consideration; requests for a TA position with a more nebulous plan, or one with a defined end point later than the end of the first semester of the student's 6th year, may be returned for revision. Support from departmental funds is conditioned upon successful pursuit of a degree program and conscientious performance of teaching responsibilities.

23. Chemistry Department Policies and Penn State Policies Regarding Changes in a Ph.D. Student's Status

A graduate student who successfully completes the Candidacy Exam (= 1st year meeting, GPA > 3.00) is admitted into the Ph.D. program. As per Graduate School policy, that status can only change through completion of the Ph.D. degree or by termination of the student's Ph.D. program for cause. This latter action is rarely taken, but all students should be aware of what "cause" means in this

context, and the detailed procedures by which the termination process is initiated, and by the processes by which it can be appealed; see Appendices I, III and IV of the Graduate Bulletin:

<http://bulletins.psu.edu/bulletins/whitebook/appendices.cfm?section=appendix1>,
<http://bulletins.psu.edu/bulletins/whitebook/appendices.cfm?section=appendix3>, and
<http://bulletins.psu.edu/bulletins/whitebook/appendices.cfm?section=appendix4>.

Briefly, Appendix I refers to termination as a consequence of violations of the Code of Conduct, Appendix III describes termination for unsatisfactory scholarship, and Appendix IV details termination specifically of graduate assistantships for inadequate performance.

Apart from this termination action, the Chemistry Department has an internal procedure to address the uncommon and unfortunate occurrence of an unproductive match between student and Ph.D. preceptor. Under these circumstances, a change can be made. Students who wish to initiate this change should discuss the matter with the graduate program manager and/or graduate program advisor first. If a preceptor initiates this change, there is a formal procedure with appropriate paperwork that must be followed. The procedure involves the preceptor notifying the student in writing of (i) their expectations, (ii) why/how the student is not meeting those expectations, (iii) what the student must do to meet those expectations, (iv) a time line for meeting those expectations, and (v) the consequences for not meeting those expectations. Both the preceptor and the student sign this memo. One consequence might be dismissal from the preceptor's research group. If a student is so dismissed, they remain in the Ph.D. program, but they must seek a new research preceptor. **Reasonable progress toward an advanced degree cannot be made if a student is not working with a preceptor or participating in a specific research group. Students in that circumstance for a protracted period may be in jeopardy of termination (see above) from the Chemistry Graduate program.** These situations occur but rarely, and they are handled on a case-by-case basis by the graduate program advisor, possibly in consultation with the full GCAC.

24. Standards of Conduct

By virtue of their maturity and experience, graduate students are expected to have learned the meaning and value of personal honesty and professional integrity before entering the Graduate School. Every student is expected to exhibit and promote the highest ethical and moral standards. A violation of such standards is regarded as a serious offense, raising grave doubt that the student is worthy of continued membership in the Graduate School community. The University Code of Conduct is found in Appendix I in the Graduate Degree Program Bulletin (<http://bulletins.psu.edu/graduate/generalinformation/genInfo7>). Violation of the Code may result in suspension or dismissal from the academic program and/or from the Graduate School. For additional information, please go to www.sa.psu.edu/ja. In particular, please familiarize yourself with the definition of plagiarism, how to avoid inadvertent plagiarism, and the consequences of getting caught committing plagiarism; see <http://tlt.psu.edu/plagiarism/student-tutorial/>.

25. Conflict Resolution

If you find yourself in conflict with another member of the Department, including another graduate student, a staff member, or a faculty member, we offer two avenues of conflict resolution: (1) Informal: The graduate program advisor and the graduate program manager, working together, will

listen to your concerns and plan with you a way forward to resolve the conflict. Students have the right to expect the strictest professional confidentiality in this meeting, but should be advised that the program advisor and manager are bound to breach confidentiality when certain allegations of misconduct or criminal behavior are made. In such a circumstance, the need to break confidentiality will be clearly communicated to the student. (2) Formal: The Eberly College of Science offers an ombudsman program in which neutral third parties meet with you, again in strictest confidence, and attempt to plan a way forward. Ombudsmen are bound by a higher standard of confidentiality and, depending on the nature of the conflict being reported may represent an avenue for reporting that will produce greater confidence on your part. We encourage you to pursue one of these options if you feel that you need our intervention. Most important of all, we in the Chemistry Department are committed to a positive scholarly and workplace environment. You should never fear retaliation or other negative consequences in response to good-faith disclosure of a conflict.

The current Chemistry Department ombudsmen include:

Crista Spratt (cus1246@psu.edu)

Lasse Jensen (jensen@chem.psu.edu)

Ken Knappenberger (klk260@psu.edu)

Pshemak Maslak (pm@chem.psu.edu)

Katherine Masters (kmasters@psu.edu)

26. Policy on Absence

The Chemistry Department has instituted a policy on timely reporting of absences that applies to all graduate students in the Chemistry Graduate Program. This decision has been made in order to promote the welfare of our students in response to concerns about their safety and well-being raised in recent surveys, as well as to ensure adequate coverage of teaching responsibilities.

Each research group may set up their own protocol for how this contact should be made and who the alternate contact person is.

The expectation of the Department is that every graduate student and postdoc will be responsible for contacting his/her preceptor in the event of an absence due to illness or emergency, or a planned absence such as a vacation or work-related travel. For students who are supported on a teaching assistantship, they should contact the faculty member who supervises their teaching. Students who are unable to reach the faculty member who supervises their teaching assignment are expected to contact the Chemistry Undergraduate Office at 865-9391. Failure to report within two hours of the expected arrival time may result in disciplinary action and/or financial adjustment to assistantships.