

**GRADUATE HANDBOOK  
IU CHEMISTRY  
2023-2024**





The IU Department of Chemistry is committed to equal opportunity and equity. We strive to increase inclusion and participation among minoritized communities at all academic levels, as collaboration among diverse people drives creativity, innovation, and research. All members of the department are expected to treat each other in a respectful and professional manner. We are all responsible for holding to those standards both on and off campus (e.g. at conferences, meetings, or field work). In addition to following University policies, we ask all members of the Department of Chemistry to support and adhere to our community norms of respectful and responsible conduct.

## EXPECTED CONDUCT

Our department has established the following standards of conduct:

- Act ethically and with integrity
- Be fair and respectful to others
- Be welcoming and inclusive to others
- Remove additional challenges facing minoritized individuals
- Manage, supervise, instruct, and advise responsibly
- Model responsible conduct
- Protect, preserve, and responsibly use University resources and property
- Promote physical and mental health and safety
- Promote a culture of compliance with legal requirements
- Preserve academic freedom
- Ethically conduct research, teaching, and community engagement
- Avoid conflicts of interest
- Carefully manage public, private, and confidential information

## EXAMPLES OF UNACCEPTABLE BEHAVIOR

The department will take disciplinary action for the following offenses:

- Sexual harassment, sexual assault, stalking, and relationship violence
- Verbal or written abuse to any member of our community
- Discrimination
- Retaliation
- Illegal or unauthorized possession, use, or sharing of weapons, drugs, or alcohol
- Scholastic dishonesty
- Unethical research, including falsification of data or information
- Unauthorized use or misuse of facilities, equipment, or services
- Theft, property damage, or vandalism
- Violation of University rules or local, state or federal laws

## SANCTIONS FOR UNACCEPTABLE BEHAVIOR

Sanctions will be determined by the appropriate academic, government, or legal entity on a case-by-case basis and may include one or more of the following:

- Warning or formal reprimand
- Freezing of accounts
- Confiscation of goods possessed, used, or shared illegally or in an unauthorized manner
- Restitution
- Reassignment of work and committee activities
- Paid or unpaid leave of absence
- Termination of employment

## REPORTING MISCONDUCT

Report suspected or alleged misconduct to any or all of the following:

- A supervisor or instructor
- Departmental or Collegiate Leadership (e.g. Chair, Human Resources, Associate Dean for DEI, etc.)
- Anonymous bias incident report: <https://reportincident.iu.edu>
- File a Title IX incident report: <https://stopsexualviolence.iu.edu/report/index.html>
- Report scientific misconduct: <https://research.iu.edu/compliance/misconduct/index.html>

**If you report misconduct, then Indiana University has a policy that will protect you from retaliation. Note that all University employees are required to report sexual misconduct to the Title IX office.**

# Graduate Handbook

IU CHEMISTRY

2023 – 2024

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## 1. GENERAL INFORMATION

**1.1 Chemistry Academic Office, Director of Graduate Studies (DGS), and Graduate Admissions and Standards Committees.** The **Academic Office** (Chemistry 021) is the focal point of most administrative functions associated with the undergraduate and graduate programs in chemistry. The graduate program is under the supervision of a faculty member, who is appointed as the **Director of Graduate Studies** (DGS). **Chemistry's Graduate Program Coordinator** is a staff member who has an office within the Academic Office. This individual is available for advice and help with all aspects of the graduate program. Their office serves as the Graduate Office (Chemistry 021F).

### **Director of Graduate Studies:**

Kevin Brown [brownmkb@indiana.edu](mailto:brownmkb@indiana.edu)

Weekly office hours are announced at the beginning of each semester and appointments may be made by email.

### **Graduate Program Coordinator:**

Kate Pleskac [kpleskac@iu.edu](mailto:kpleskac@iu.edu)

Chemistry 021F; 7:30 am – 4:00 pm, Monday-Friday.

### **Graduate Admissions Coordinator:**

Dalane Anderson [dga@indiana.edu](mailto:dga@indiana.edu)

Chemistry 021J; 7:30 am – 4:00 pm Tuesday-Thursday, and by email Monday/Friday.

Associated with the graduate program are two faculty committees that serve the graduate population: the **Admissions Committee** and the **Graduate Standards Committee**.

The **Admissions Committee** is largely responsible for the processing of applications from prospective graduate students and consists of a chairperson and faculty representatives from each area of chemistry (analytical, chemical biology, inorganic, materials, organic, and physical). This committee reviews applications from prospective graduate students, recommends admissions and financial assistance to qualified applicants, and coordinates visits by prospective students.

The **Graduate Standards Committee** supervises the maintenance of records of all currently enrolled graduate students and serves as an advisory group in the planning of a program of study for each graduate student. It is chaired by the DGS and includes a representative from each area within Chemistry. This committee oversees the research group selection process. In addition, this group periodically reviews the record of each graduate student, selects awardees of prizes and fellowships, recommends termination of enrollment in the graduate program when progress toward an advanced degree is unsatisfactory, and considers petitions for readmission for any student whose enrollment has been terminated.

**1.2 Full-Time Student Status.** In October and April, the department's Graduate Office will advise students on enrollment. Before year 4, students register for the **maximum yearly credit hours (30 credits):** 12 hours, 12 hours, 6 hours). After enrolling in major/minor/required coursework, students enroll in research hours (e.g., C810-880) to bridge the amount needed for that semester. For example, an Inorganic major may take C635 (3 hours), C636 (3 hours), C500 (4 hour), and C830 (2 hours) for 12 hours total. It is important that students add additional credits (typically research hours, C810-880) when they withdraw from a course (see Graduate Coordinator when considering all adds/drops). Students normally receive a deferred or **R grade** for research credits (C810-880) in which they are enrolled during the first year. In subsequent years, either a letter grade (**A-F**) or a deferred grade (**R**) will be awarded at the discretion of the research faculty.

When a student passes their Qualifying Exam and earns 90+ credit hours, they begin taking *CHEM-G 901, Advanced Research*. Students in this stage reduce enrollment from 12 hours to 6 hours each semester and no longer enroll during the summer term. Chemistry students typically reach G901 status in the fall semester of their fourth year. Tuition for G901 is a flat fee of \$150. Because tuition for G901 students is inexpensive, Research Advisors consider G901 status when deciding who to hire as RAs. Enrollment in G901 is limited to six times. If a student's G901 eligibility expires, the student switches to enrolling in research hours, e.g., C810-880, for 6 hours if an SAA or 1 hour if they are unfunded (no SAA). Note: G901 students are not assessed the student activity fee. If a G901 student wants to participate in recreational sports, they will need to pay the associated fee (for an amount, see [Student Central's mandatory fees](#)).

**PhD students must be enrolled every semester (excluding summer) until they obtain their PhD.** Failure to do this will terminate enrollment in the PhD program and necessitate formal readmission to the Graduate School in order to complete the degree program. Readmission is only granted upon a satisfactory explanation and payment of past fees. Only MS candidates (who do not hold an SAA appointment) are *not required* to be enrolled *after* completion of coursework requirements.

**1.3 Transfer of Credits.** Graduate School regulations permit students to transfer up to 30 hours of graduate credit for approved courses that count toward the required 90 credits for the PhD. This requires special petition and such transfers do not automatically fulfill any departmental major or minor course requirements, unless the individual Advisory Committee specifically approves this. Typically, the maximum requirements approved are one major and one minor course. Petitions are solicited and reviewed in the winter of a student's first year after they have joined a research group.

In general, credits transferred must be lecture courses for which a grade of B or better was obtained that were taken in a U.S. graduate institution and not previously used for credit towards a bachelor's degree. Courses that were taken as an undergraduate in excess of the minimum graduation requirements for the bachelor's degree or as a graduate student towards completion of an MS are acceptable. Courses that are not substantially equivalent to courses the student has taken here may not be approved.

**To count toward the 90 credits required for the PhD, the courses must have been taken within 7 calendar years of advancement to candidacy.**

**1.4 Programs and Degree Types.** Students can complete an **MS or PhD in Chemistry**. In addition, Chemistry participates in several interdepartmental programs. Details of these programs are given in the *University Graduate School Bulletin*, which is updated yearly at: <https://graduate.indiana.edu/academics-research/bulletin.html>

- a. Dual MS chemistry/MSES: This is a dual Master's Degree program involving Chemistry and the School of Public and Environmental Affairs (SPEA).
- b. Quantum Information Science (QIS)-MS: Classes are listed from Chemistry, Computer Science, Engineering, Mathematics, and Physics.

The Department also supports an MS-to-PhD Bridge program (Section 8).

**1.5 Introductory Courses to Graduate Studies in Chemistry.** All students pursuing an MS or PhD in Chemistry must complete two introductory courses to graduate studies. These courses are **Professional Development Seminar (C505)** and **Introduction to Research (C500)**.

All students begin their graduate studies by taking a **Professional Development Seminar** during the fall semester of their first year of graduate studies. It provides information on pedagogy to enhance training in teaching as well as career planning and discussions on scientific ethics, mentoring, research foundations, and working in a diverse environment. This course also prepares students for the process of selecting a research area and advisor and is complemented by **Introduction to Research**. All students begin their

research experience by taking this course during their first year of graduate studies. It provides a mechanism to learn about an area of research before committing to any specific research program. Even students with considerable research experience are required to enroll in C500. See Section 4.2 for a more complete description of C500.

**1.6 Major and Minor Courses.** All students are completing a PhD degree in **Chemistry**. To acquire adequate breadth and depth of study, students will complete classes within their designated “Major” and “Minor” areas. The middle digit of chemistry course listings usually indicates the specific area of the course with regards to fulfilling major and minor requirements (e.g., 1: Analytical; 2: Materials; 3: Inorganic; 4: Organic; 6: Physical; and 8: Chemical Biology). It should be noted that C500 and C505 do not fulfill any lecture course requirements for the MS or PhD major or minor.



Students are expected to take courses until the MS and PhD requirements are completed. MS students should be careful to plan their programs to finish courses early since they will not normally receive fee scholarships unless they hold student appointments.

**1.7 Interdisciplinary Research.** An increasing amount of research is being conducted at the interface between two or more of the traditional areas of chemistry. In these cases, students are encouraged to discuss the course enrollments that best suit their research activities. In such cases, permission to swap one minor course requirement is granted by the area

course advisor or by the DGS. It is also possible for students to create their own individualized minor upon request of the Graduate School.

**1.8 Courses outside the MS and PhD Requirements.** Students are encouraged to consider relevant courses in other departments. For example, courses listed under the various interdepartmental programs, such as Biochemistry, Molecular-Cellular-and-Developmental Biology, Chemical Physics, Quantum Information Science, and Environmental Chemistry, are recommended. Many students also find value in taking applied mathematics courses, statistics courses, or computer science courses as they are a critical aid to their research program. It should be noted that not all courses count toward the 90 credits required for the PhD. Only those courses listed in the *University Graduate School Bulletin* are eligible for graduate credit: <https://graduate.indiana.edu/academics-research/bulletin.html>

**1.9 Research and Thesis Advisor.** Each student in research must be associated with a Research Advisor. Students express their preferences for Research Advisors through a specific procedure outlined as part of C500 that includes attendance at presentations and participation in interviews/rotations. Upon completion of the C500 course, **PhD Thesis Advisors are established by mutual agreement between the student and the faculty member involved**, subject to approval by the Graduate Standards Committee and the Department Chair. The Thesis Advisor guides the student through remaining coursework and research leading to a degree and serves as chairperson of the Research and PhD Advisory Committees, if the student is accepted for work leading to that degree. Should mutual agreement not be possible between a student and their C500 advisor, the student is to interview with 3-4 additional faculty members to identify a new Research Advisor; students have until the end of May to find a new Research Advisor. MS students are to remain associated with their Research Advisor from the time at which submission of MS thesis was decided. Bridge fellows remain associated with their C500 Research Advisor through completion of the 2-year program. If the Bridge student transitions into the PhD program, they can reconsider their Research Advisor, if desired.

**1.10 PhD Advisory and Research Committee.** At the end of the first year, students pursuing a PhD are asked to begin selecting their committee members. In addition to the student's research advisor, the committee is composed of two other faculty members within the student's declared major, and one faculty member typically representing the student's minor area. The student can suggest one of the major



representatives and the minor representative; the DGS appoints the second major representative. The final committee composition will sometimes be affected by availability of certain faculty to serve on the committee due to research/family leave and other service obligations. The students will meet with their committee members once every year. More information on this committee can be found in Section 9.1.

Please note that students pursuing an MS or participating in the Bridge Program must identify a faculty referee (in addition to their Research Advisor) to evaluate their thesis.

**1.11 5-Year PhD Culture.** Students are encouraged to take control of their advancement through their own course of studies leading to a PhD within 5 years. The relationship between student and mentor, and the expectations placed upon the student changes each year. To aid students in preparing for this transition, incoming students will attend a Professional Development Seminar series (C505).

Students are expected to ensure that they stay on track throughout their PhD as they complete C500, schedule their Qualifying Exam (typically in their 5<sup>th</sup> semester), complete all the related paperwork, work toward and submit papers in a timely manner, attend conferences and workshops to develop professionally and to defend their thesis. A 5-year timeline is provided as a guide (see later). As deviations from the timeline are likely to occur, they should be addressed with the Research Advisor and in consultation with the DGS to create a modified timeline. Any students who are not advancing toward their PhD are at risk of being placed on probation with the possibility of being dismissed from the program unless specified milestones are being attained in a timely manner (see Section 12: When Things Go Wrong, for more guidance).

## 2. FINANCIAL ASSISTANCE

**2.1 Means of Financial Assistance.** Unless entering with a fellowship, most graduate students are granted some form of financial support that is outlined in their admissions offer. Financial assistance will generally be in one of the following three forms: (a) Associate Instructorship, (b) Research Assistantship, and (c) Fellowship or Traineeship. Funding is typically guaranteed for 5 years for PhD students in good academic standing who are making satisfactory progress toward their degree (see your offer letter for details). If you need longer than 5 years, your advisor may cover you as a Research Assistant or you can work as an Associate Instructor *if there are available positions*. **It is important to realize that the department has a limited number of research assistantships per year, and faculty appointing students on research assistantships must report to sources of funding on progress toward reaching research milestones. Thus, students must be making adequate research progress to be supported by these mechanisms and pursuit of external fellowships is strongly encouraged.**

**2.2 Associate Instructorships (AI).** An Associate Instructorship (AI) not only pays the major initial cost of an education but also gives the student experience in leadership, scientific communication, and training in the fundamentals of chemistry. All PhD candidates are expected to teach, at least part-time, for two-semester unless supported through external fellowships. Most AIs are half-time appointments (no more than 20 hours/week). Most students serve as AIs during their first 2-6 semesters as graduate students before being transferred to Research Assistantships. To be eligible for continued support by AI appointment, students must satisfactorily fulfill all the responsibilities of the appointment.

**2.3 Research Assistantships (RA).** Research Assistantships (RAs) are awarded on the basis of good academic standing, research experience, and the involvement of recipients in research problems for which assistantship funds are available. Stipends are generally comparable to those of AIs and a 0.5 appointment corresponds to 20 hours/week for the source of funding. In all cases, the specific terms of the RA are decided upon by the faculty member responsible for the funds involved.

**2.4 Understanding Your Appointment.** Most Student Academic Appointments (SAAs – AIs and RAs) are capped at half-time (20 hours/week) unless approved by a student's advisor, the DGS, and the College. The reason why the appointment is capped at 0.5 time is because graduate students are also enrolled in classes and this arrangement provides the necessary time for their completion. Classes include research credit that a student may be registered for, where 1 credit requires 2-3 hours of study,

research, etc. for the typical student.

**2.5 Fellowships.** A number of sources for fellowship support for particularly well-qualified students exist. Several federal agencies (e.g., NSF, DOD, Ford, Hertz) have competitive programs that usually require application early in the first-year of study, the due dates start in late October. The NIH offers fellowships (Kirschstein) for graduate students to apply for and usually requires that the advisor already has NIH funding. The NIH fellowships can be applied for during the duration of graduate studies. Various private institutions also fund fellowships, often in specific research areas. A link to these and other programs can be found on the Graduate Program website. The Graduate Office and DGS will assist students will applications insofar as possible.

**2.6 Graduate School and Department Fellowships.** The Graduate School sponsors a limited number of fellowships for students in addition to supplemental fellowships for entering students. The Chemistry Department annually awards a number of fellowships for advanced students (G901 status, see section 1.2). These may be either full fellowships or of the partial or supplemental type. Advanced students will submit their applications for Department Fellowships in January/February using [IU Scholarships](#).

### 3. SCHOLASTIC STANDARDS

Continuation in the University Graduate School is dependent upon performance in courses, research, and examinations; progress in research and attitude toward advanced study are key considerations in Graduate Committee decisions.

**3.1 Grade point average/probation.** When the *overall* grade-point average falls below 3.0, a student is automatically placed on academic probation by the College of Arts and Sciences' (COAS) Graduate Office. Since the College considers both research and lecture courses grades in judging probation cases, it is possible for good grades in research to offset poor grades in lecture courses. However, the Chemistry Department also requires a 3.0 grade-point average for all coursework (major and minor courses excluding C500/C505) in addition to the College's overall GPA requirement. This means that students may be placed on probation by the College at the request of the Department, based on insufficient progress toward degree.

Students placed on probation at the end of their first semester of graduate study in the Department may be dismissed from the graduate program at the end of their second semester of enrollment. After the first year of graduate study in the Department, students on probation may be subject to dismissal at the end of the semester of notification if adequate improvement in grades is not demonstrated. For a student to regain normal standing after being placed on probation, the grade-point average during the following semester must be high enough to achieve an *overall* average of 3.0 or higher. In certain cases in which a student's cumulative average is raised, but not to the 3.0 minimum grade-point average, an additional semester may be granted to attain an overall 3.0 average.

For purposes of computing grade-point averages, a plus (+) grade is considered 0.3 higher than the grade-point unit, and a minus grade (-) is 0.3 less; accordingly, an overall B- average is not satisfactory. Grades below 2.0 are *not counted toward the completion of degree requirements* but are counted in determining a student's grade-point average.

**3.2 Research Grades.** The grades accumulated during courses C500/C505, 800, and C810-880 are not used by the Department in computing averages, although they are considered in making probation or termination decisions by the College of Arts and Sciences Graduate Office. Grades in courses outside of the major and minor are also not used in the computation of grade-point averages by the Department.

Students who are not making sufficient progress in research may be placed on probation by their advisor in consultation with the DGS.

**3.3 The Grade of Incomplete (I).** It is the responsibility of the student who has incurred the grade of Incomplete (I) in any course to fulfill the requirements of that course within one calendar year from the



date on which the grade was recorded. The student is expected to complete all work in time for the instructor to assign a new grade before the expiration of this time period. If a student is unable to meet this requirement with cause and needs further time to complete the course, a petition for an extension of the deadline to the Graduate School must be submitted through the Graduate Office.

**3.4 Deferred Grade of R.** Several Graduate courses such as C500, 800, and C810-880 are not necessarily completed in the course of a single semester. For these courses a deferred grade of **R** may be awarded at the end of a semester to indicate that the appropriate grade will be given at a later time when the coursework is completed. Since students accumulate most **R** grades after advancement to candidacy, it is customary to request removal of all **R** grades just prior to the exit seminar for degree completion; however, this may be done at any time. **All such changes must be processed through the Graduate Office. Please see the Chemistry Graduate Program Coordinator.**

**3.5 Minimum Credits.** All students, including those on probation, are expected to carry normal workloads. Students on probation during the first or second year of graduate study are required to enroll in at least 6 hours of graduate coursework that count toward an advanced degree.

**3.6 Academic and Research Misconduct.** Academic misconduct is defined as any activity that tends to undermine the academic integrity of the institution, including (but not limited to) cheating, fabrication, plagiarism, interference, violation of course rules, and facilitating academic dishonesty. Details are outlined in the [Code of Student Rights, Responsibilities, & Conduct](#). The University Office of the Vice Provost for Research oversees research compliance and provides workshops on how to avoid certain unethical behaviors such as fabrication, falsification, and plagiarism. Information and resources are available at the following website: <https://research.iu.edu/compliance/misconduct/index.html>. If you witness cases of academic or research misconduct, you should report this to your advisor, the DGS or department chair, who can take measures to deal with the problem appropriately.

In addition, given the growing awareness of AI-based writing tools and related technology, the department has outlined the following expectations to graduate students in our program. When preparing documents for degree milestones—C500 document, qualifying exam document, and thesis—please keep the following policies in mind.

- ChatGPT and other AI-based writing tools do not meet the criteria of authorship. According to ACS Publications' [Author Guidelines](#), authorship is defined by significant scientific contribution as well as accountability and responsibility for the results, which AI tools cannot provide.
- The use of ChatGPT and other AI-based writing tools is permissible; however, they should not be used in replacement of developing one's scientific writing skills as writing is an important professional skill.
- ChatGPT and other AI-based writing tools should be disclosed to advisors and in your documents. Such disclosure may appear in the Methods or Acknowledgement sections of documents and should include an explanation of how and when the tool(s) was used. AI-generated text and images should be cited appropriately.
- Authors are responsible for the documents they submit. Authors are encouraged to familiarize themselves about the [strengths and limitations of AI-based writing tools](#) to ensure that anything prepared with assistance of an AI tool (including images) is accurate, permissible for re-use, and original (not plagiarized). Plagiarism is the presentation of ideas/writing from sources other than yourself without full acknowledgement. Plagiarism is also academic misconduct as outlined in the [Code of Student Rights, Responsibilities, & Conduct](#).

These policies are modified from [ACS Publications](#) and extend to graduate-level course work unless additional guidelines are provided by your course instructor.

## 4. PROFESSIONAL DEVELOPMENT SEMINAR/INTRODUCTION TO RESEARCH

Research is the main emphasis of the MS, Bridge, and PhD programs. The choice of Research Advisor is, therefore, tremendously important. The following section explains how students are informed of research done in different laboratories.

**4.1 Chemistry C500.** Chemistry C500 is a course for all new graduate students enrolled in the Bridge and PhD programs in chemistry. Normally, the course begins in the fall semester and continues through the second semester of the academic year for a total of 6 credit hours. Two important purposes of the course are to (1) stimulate an acquaintance with all members of all chemistry faculty and to (2) promote an active start in research.

**4.2 Choosing a Research Group.** Students will participate in activities during C505 that aim to help students identify their areas of scientific research as well as preferred mentoring style. These considerations are important when choosing a research group. To become familiar with active research projects, students are strongly encouraged to read about the projects in faculty laboratories by visiting their web pages and reading papers. There are additional events/procedures in place to also help students gain information about the ongoing research within the department and the different group cultures. These activities include:



(a) C500 Faculty Talks: All first-year students will also attend short lectures given by faculty on their research. These talks are scheduled for August and early September. Students are expected to attend the lectures given by professors in their major and minor areas and all assistant professors. Students are expected to attend at least 14 faculty talks.

(b) Students will be asked to provide a list of potential groups to the Chemistry Graduate Program Coordinator by a set date in September and also indicate if they plan to proceed with the interview or rotation pathway for group selection. **Bridge Students may elect to begin in research at this stage of the program or to interview/rotate with groups; this decision should be made in consultation with the Bridge Program Director.**

(c) Interview Pathway: Select 5-6 groups that interest you and meet with faculty/graduate students/postdocs in ~3 interactions each. Deepen connections with 2 groups by spending a week immersed in each lab. Meet with at least 1 assistant professor in area of interest or near area of interest.

(d) Rotation Pathway: Provide a ranking of your top 5 groups. The Graduate Standards Committee will then finalize 3 groups for you to rotate with for 3 weeks each. **You are guaranteed to rotate in your top two choices, but your third rotation is at the discretion of the Graduate Standards Committee and may be modified to ensure balance in the program.** Please discuss with potential advisors the nature of their rotations (desk/literature/hands-on). The rotation pathway is required by ChemBio students and those interested in QCB fellowships. Students may switch from the rotation to interview pathway at any time by notifying the DGS.

(f) A signature sheet will provide confirmation of completion of either the interview or rotation pathway. A group selection reflection (see C505 syllabus) is also required. These materials are to be turned into the Chemistry Graduate Program Coordinator upon completion of interviews/rotations and include a ranking of your top group choices. **Please note that we try to place all students in their top group choices for C500 research; however, limitations in funding and a need to balance the program may result in students not being placed in their top choice. Thus, it is strongly encouraged that you identify at least 2 groups as possible research homes and to discuss the willingness of a faculty member to host you in their group well in advance of the group selection deadline.**

## 5. SECOND-YEAR REQUIREMENT: A800, B800, M800, N800, R800, or P800

All doctoral students must successfully complete the chemistry seminar course in their chosen major (A800, B800, M800, N800, R800, or P800) during the third and fourth semester. Analytical Majors will take the course A800; Chemical Biology, B800; Inorganic, N800; Materials, M800; Organic, R800; and Physical, P800. Students will enroll in 2 credit hours in the fall semester and meet with their entire year cohort for class. They will then enroll in 1 credit hour in the spring semester and meet by area. The fall semester is focused on scientific communication and other professional training. During the spring semester, students will complete either a scientific presentation, a limited number of cumulative exams, or an original research proposal; the format depends on the area and is self-contained to one semester only. These courses do not count towards the 12 credit- hours required to satisfy the major coursework requirements or towards the minor credit-hours required for a MS or PhD in chemistry.

MS students are not required to complete this seminar course; however, Bridge Fellows are encouraged to enroll in this course if they are considering transitioning into IU's PhD program to keep them on track for a Qualifying Exam in their 5<sup>th</sup> semester.

**5.1 Grades.** Students will be assigned a letter grade for their second-year requirement course at the end of each semester. A grade of R may be assigned to be replaced by a letter grade upon completion of the final semester of the course.

**5.2 Course Descriptions.** Details of the second-year course requirement vary depending upon the area of chemistry in which the student is majoring.

## 6. QUALIFYING EXAM REQUIREMENTS

Before a student is admitted to candidacy for the PhD degree, the Graduate School requires that a candidacy examination be passed.

**The date for the exam needs to be during the 5<sup>th</sup> semester of graduate studies and it must be scheduled prior to August 1 (See 6.2 Extension).**

**6.1 Specific Components of the Qualifying Examination.** To satisfy this requirement, Chemistry PhD candidates (1) prepare a written progress report, (2) give a research seminar and (3) are administered an oral examination by the Advisory Committee not later than the end of their fifth-semester of residence.

**6.2 Extension.** If an extension of the Qualifying Examination is needed, the student should submit a petition to the DGS. This petition must be supported by the Research Advisor and the Advisory Committee and must state reasons for the request. If this petition is approved, the student must immediately arrange for the examination to be held within a reasonable time frame, usually early in the following semester. Only under extraordinary circumstances can examinations be delayed longer, and such extensions will require approval from the DGS. *The desire to complete additional research is not an appropriate reason to delay the fifth-semester examination.* **Failure to adhere strictly to these guidelines will result in placement on academic probation with contingency to termination of enrollment in the degree program.**

**6.3 Qualifying Exam Report Requirements.** The student should meet with their Research Advisor several months in advance of their exam date to discuss the content of the report and a timeline for its completion. The report should be no more than 50 pages in length. Submit this document to your committee members no later than two weeks before your scheduled exam for review. Different advisors will expect different levels of review prior to submission to your committee so please consult with them frequently as you are preparing your document. Especially long experimental sections required by the Research Advisor may be included in an appendix that does not count toward the word limit. Guidelines for preparing the report are given below:



1. **Introduction.** Provide a reasonable historical introduction to your project and to outline the goals for your research. *Particular focus on quality of this chapter is more valued than the length of this section.*
2. **Experimental.** This section should be in a concise, well-written format that is characteristic of the best journals in your field. This section should be well organized, avoiding redundant or irrelevant information.
3. **Results and Discussion.** Again, a concise analytical description of the results of experiments or computational studies, followed by a discussion of the implications of the results and how they relate to the initial motivation of the research.
4. **Plan for Completing the Thesis.** This section should be carefully thought out and provide a reasonable amount of detail, including feasibility studies. Though the content of your thesis could be very different from your proposed work, this component of the fifth-semester report should provide some long-range guidance in formulating the thesis.

A pdf copy of your report as well as 1-2 page summary of future work must be submitted to the Graduate Office after you have successfully completed the oral examination.

**6.4 Timeline.** Completed candidacy forms must be submitted to the university Graduate School no less than six months prior to defense. The Graduate School approves the student's advancement to candidacy.

**6.5 Deficiencies in the Qualifying Exam.** In the event that not all components of the candidacy exam are deemed by the Graduate Committee as adequate for advancement to candidacy, several courses of action may be considered.

1. Students with a sufficiently large body of research completed to date, as judged by the Committee, may be advised to pursue an MS degree. If, in the completion of the master's research, the student demonstrates strong potential for completion of PhD research, the student may be advised to petition the Graduate Office for reinstatement into the PhD program.

2. If the student's coursework is strong, but the body of research is deemed by the Committee to be inadequate, the student may be advised to consider the MAT program OR the dual MS Chemistry/MSES program, both of which are coursework based and require no thesis.

3. If failure of the Qualifying Examination is associated with extraordinary circumstances (sudden illness, family emergency, catastrophic laboratory equipment failure, etc.), the student may be allowed to retake the oral examination and/or rewrite the progress report. The Graduate Bulletin states that students can retake the exam no more than once. This option may only be taken with full consent of the Graduate Committee. **Should students be experiencing extraordinary circumstances in advance of their Qualifying Examination, they are advised to discuss their situation with their Research Advisor or the DGS as a Leave of Absence may be appropriate (See Section 12).**

## 7. MASTER'S DEGREE

A MS Degree may be conferred upon the holder of a bachelor's degree or an MS in another discipline who completes the requirements specified below. According to Graduate School regulations, **all work for the MS degree must be completed within five years.** Acceptance into the MS program must be finalized by the DGS and Chair of Chemistry.

**7.1 Major.** A major may be selected from the following areas of Chemistry: analytical, chemical biology, chemical physics, inorganic, materials, organic, or physical.

**7.2 Credit and Courses.** A total of 30 hours of graduate credit with a minimum of 9 credit hours of major coursework and 21 credit hours of research are required.

**7.3 Thesis.** A thesis is required. This must embody the results and interpretation of original research or, with prior permission of the Graduate Committee, a comprehensive review of a significant chemical literature.

The thesis needs to be filed electronically with the University Graduate School, following the guidelines found here:

<https://graduate.indiana.edu/thesis-dissertation/formatting/masters.html>  
<https://graduate.indiana.edu/thesis-dissertation/submission/masters.html>

The student should, if requested, provide a bound hardcopy to the Research Advisor. Two members of the Graduate Faculty and the DGS must approve the thesis before the student can be recommended for the MS degree.

**7.4 MS + PhD Track.** While an MS degree is an exit pathway for students originally admitted into the PhD program, students completing the PhD may also add a MS track to their studies in consultation with the DGS and their advisor. While additional coursework is not typically required, **a thesis distinct from the content of the student's PhD thesis is required.** The MS thesis is typically shorter than a PhD thesis and may be an appropriate addition to one's studies when the student has 1) written a comprehensive review of significant literature that would not be a part of their PhD thesis, 2) completed substantial collaborative research that will not serve as the basis of chapters for their PhD thesis, or 3) switched research groups and has research from the original group that provides the thesis content. Other scenarios may also be appropriate, but **a key feature is that the MS thesis content should be distinct from and not diminish the quality of the future PhD thesis.**

**7.5 Master of Arts for Teachers (MAT) Degree.** See the *Bulletin of the University Graduate School* for information and special requirements of this joint program with the School of Education. It should be noted that only those who are certified to teach high school chemistry in Indiana are eligible for this degree.



**7.5 Dual MS Chemistry/MSES Degrees.** See the *Bulletin* for information and special requirements of this dual degree program in Chemistry and Environmental Science with SPEA. A minimum of 51 total credit hours is required, with a minimum of 21 credits required in both Chemistry and Environmental Sciences, distributed among six areas of Chemistry and Environmental Science. Students must have an approved experiential component (e.g., internships). The thesis requirement is waived for this dual-degree program.

**7.6 Steps in Completion of Master of Science Degree.** The following is a checklist showing the timing and responsibility for steps in obtaining the MS degree. A student should refer to this list throughout their progress toward the degree to ensure that all necessary action is taken.

## STEPS TO THE MASTER OF SCIENCE (MS) DEGREE IN CHEMISTRY

Step	Individual or Office Responsible for Action	Step	Timing
1	DGS	Appointment with Graduate Committee to plan course of study	During pre-semester enrollment period
2	Student	Choice of Research Advisor (usually made through C500 process)	First semester
3	Student	File application for MS degree at Graduate Office; remind Research Advisor to remove R grades	Early in semester in which student plans to graduate
4	Student	Completion of course requirements	No later than last semester in school
5	Student and Research Advisor	Unbound copy of thesis in final form approved by Research Advisor for review by faculty referee	At least two weeks before completion of step 7
6	Student and DGS	One unbound copy of thesis in final form to be approved by DGS	At least one week before completion of step 7
7	Student	Submit electronic copy of thesis through ProQuest	By the 15 <sup>th</sup> of the month the student plans to graduate
8	Student	File original signed acceptance page to the University Graduate School	By the 27 <sup>th</sup> of the month the student plans to graduate (except May and December)
9	DGS	Recommends to Graduate School that degree requirements have been satisfied	Within two weeks after completion of step 7
10	President (upon recommendation of Dean of Graduate School)	Degree awarded	Approximately one month after step 7 (degrees are awarded monthly)
11	Student	<b>Formal checkout, see Graduate Program Coordinator</b>	



## 8. BRIDGE PROGRAM

The Department of Chemistry currently has partner status with the American Chemical Society (ACS) to support a MS-to-PhD program. Students participating in this program apply through the ACS interface. Students participating in this program are supported on fellowship for two years while they complete a MS degree that prepares them to seamlessly transition into our PhD program or apply for a different PhD program should they be interested.

**8.1 Coursework.** Depending on the coursework background of the Bridge Fellow, supplemental undergraduate courses may be required in consultation with the Program Advisor. Otherwise, the program requirements follow that of the PhD degree, with students completing 12 credits worth of major courses (analytical, chemical biology, chemical physics, inorganic, materials, organic, or physical) and 6 credits worth of minor courses within 2 years. Additionally, Bridge Fellows complete C500 and C505 in year 1 and an optional area-specific research seminar in year 2 (see Section 5). This coursework is completed with Research Credits (C810-880) to reach full-time student status.

Modifications to the coursework can be made in consultation with the Program Advisor as the minimum MS degree requirements are completion of major courses + research credit totaling 30 credits. However, such modifications would delay transition into the PhD program.

**8.2 Advising.** All Bridge Fellows are to meet frequently with the Bridge Program Director to discuss progression through the program.

**8.3 Selection of Research Advisor.** Bridge Fellows may select a Research Advisor as early as mid-September and no later than the enabling date for PhD students. The process begins during the Bridge Program orientation week with a series of meetings with potential advisors and their students/postdoctoral scholars. These meetings are to continue through the C500 Faculty Talks, which Bridge Fellows also attend. After completion of the C500 Faculty Talks, Bridge Fellows may begin research at any time upon identification of a suitable Research Advisor.



Bridge Fellows are welcome to participate in the interview/rotation pathways outlined for PhD students in consultation with the Program Advisor.

**8.4 Thesis.** Bridge Fellows may submit a master's thesis or a publication as a defining point for an MS degree. However, if generating the thesis or publication has a halting effect on the transition to the PhD program, it will not be required. Qualification for the PhD program in the traditional track in the IU Chemistry graduate program takes place in the fifth semester. Therefore, if the best course of action for the Bridge Fellow is to apply their work in the Bridge Program toward qualifying for the PhD program at IU, they will be on track to undertake the steps for qualification in advance of the fifth semester at IU.

The student should provide, if requested, a bound hardcopy to the Research Advisor. Two members of the Graduate Faculty and the DGS must approve the thesis before the student can be recommended for the MS degree. The thesis needs to be filed electronically with the University Graduate School, following the guidelines found here:

<https://graduate.indiana.edu/thesis-dissertation/formatting/masters.html>

<https://graduate.indiana.edu/thesis-dissertation/submission/masters.html>

## 9. DOCTOR OF PHILOSOPHY DEGREE

The program leading to the PhD degree emphasizes the attainment of high ability and knowledge in a specialized area of chemistry, but it also requires the further development of broad knowledge and experience in the field. By the time the degree is earned, the student should show promise of becoming a capable and independent investigator in chemistry.

**9.1 Advisory and Research Committees.** The Graduate School requires that students in doctoral programs be assigned an Advisory Committee no later than one year after admission. In the Department of Chemistry, there is a four-person committee that includes the student's Research Advisor. The student selects a second major area representative and a minor representative. The DGS, in consultation with the Graduate Standards Committee, appoints the third major representative. Students are required to meet with their committee members once each year to provide a brief status update. These meetings are meant to help students to better gauge progress toward their degree and cultivate a professional relationship with their committee members.

This Advisory Committee cannot be formally nominated as the Research Committee until the student has been advanced to candidacy, but it is anticipated that the members of the Advisory Committee are to approve an outline of courses, advise the student on research during the period prior to advancement to candidacy, and conduct the Qualifying Exam in the fifth-semester review of overall progress.

After completion of requirements for candidacy, the Research Committee should be formally nominated. The Committee normally includes the Research Advisor as chair, two additional faculty representatives from the Department (usually in their major area), and one faculty representative from a minor field. All members must be members of the Graduate Faculty and have endorsement to direct doctoral dissertations. Usually, but not necessarily, these Committee Members are the same as those of the Advisory Committee. This Committee should immediately consider and formally approve the student's proposed thesis outline, advise the student on research throughout its subsequent progress, eventually conduct the final doctoral examination, and approve or reject the thesis presented by the student. Please note that the form of Nomination of Research Committee and a proposed thesis outline must be accepted by the Graduate School at least six months prior to the thesis defense.



**9.2 Basic Courses.** Each student is required (unless specifically exempted by the Graduate Standards Committee) to take the basic graduate level courses in their major area and all beginning graduate students are required to enroll in C500 and C505. Examples of basic courses are as follows: Organic students take Spectrometric Methods of Structure Determination (C503). Inorganic students enroll in Spectroscopic Methods (C502). Analytical student take Chemical Instrumentation (C501). Materials Students are expected to take Fundamentals of Materials I (M501) plus Fundamentals of Materials II (M502). All students must take the second-year seminar course during their third and fourth semesters: A800, B800, N800, M800, P800 or R800.

**9.3 Major.** A major may be taken in analytical, chemical biology, chemical physics, inorganic, materials, organic or physical chemistry. A minimum of 12 hours, exclusive of research, is required for the major. In some instances in which a student has been exempted from one or more required courses in the major field, they may ask the DGS to petition the Graduate School for acceptance of fewer than 12 hours of formal course work for the major.

**9.4 Minor.** A minor provides additional breadth and depth to the individual's program. One minor is required that consists of a minimum of two courses that may be either within or outside of the Chemistry

Department. If a Chemistry student elects an outside minor, all requirements established by the outside department must be satisfied. If an inside minor is chosen, the student must take at least six credits in areas other than the major. These courses need not be isolated to just one area. Students are suggested to discuss the best courses with their Research Advisor. Chemistry minors that students have taken in the past include: Analytical, Biochemistry, Chemical Biology, Environmental, Inorganic, Organic, Materials, Mathematics, Physical, Physics, Scientific Computing, Sustainable Energy, and Chemical & Physical Biology.

**9.5 Individual Minor.** In certain cases, minors not specifically listed in the bulletin may be approved by the Dean upon recommendation of the student's Advisory Committee, provided such approval is requested *prior* to (or during) assignment of the PhD Advisory Committee. Examinations procedures (if any) or other requirements (for example, stipulation of the minimum grades acceptable) should also be specified in the proposal to the Dean. For consideration, please submit the following to the DGS: (1) name of individualized minor, e.g., "molecular materials", or, "bioanalytical chemistry"; (2) a short paragraph justifying the minor, and (3) a list of courses totaling 6 credits or more. Students are advised to discuss this opportunity and to write the application material in direct consultation with their Research Advisor. A form is available in the Graduate Office to assist in the creation of an individualized minor.

**9.6 Outline of Course of Study and Appointment of Advisory Committee.** The requirements for coursework in Chemistry are minimal. Accordingly, careful selection and planning are required in order to achieve maximum coherency and educational benefit. Since most of the course requirements are met during the first two years, practical considerations require that a complete course program be planned well before the start of the second year of studies. The completion of this step is formally marked by submission to the Graduate Office on an Outline of Course of Study together with the Graduate School Appointment of Advisory Committee form. Both forms should be signed by the four members of the Advisory Committee. By their signatures, the faculty members involved indicate approval of the planned outline of coursework.

It is recognized that this plan of course work may need to be revised in some cases as student's interest change or courses become unavailable due to faculty sabbatical/family leave etc. A student wishing to make changes must get the permission of their Advisory Committee. The course outline forms are kept on file in the Graduate Office. These should be modified and approved.

**9.7 Qualifying Exam (Fifth-Semester Review).** Each PhD candidate will be examined orally by their Advisory Committee not later than the end of the fifth semester of residence. As part of this examination, each student must: (a) submit a progress report demonstrating substantive research progress during the first five semesters, (b) submit a plan of research proposed for the remainder of the thesis, and (c) present a seminar describing their work to the Department. Additional requirements may be imposed in specific areas. See *Section 6 for more details*.

**Students may postpone this exam for a limited period owing to scheduling problems, but must request such a postponement in writing to the DGS stating cogently why the exam cannot be taken within the normal time limitation and indicating the scheduled date of the postponed exam.** The desire to perform additional research is not an appropriate reason to defer this review. Failure to take this exam in the fifth semester will be presumed to indicate unsatisfactory progress in research and constitutes grounds for probation and possible termination.

**9.8 Admission to Candidacy.** A student is recommended for admissions to candidacy for the PhD degree upon satisfactory completion of the Qualifying Exam. At this time the appointment of a formal PhD Research Committee is recommended to the Graduate School by the DGS.

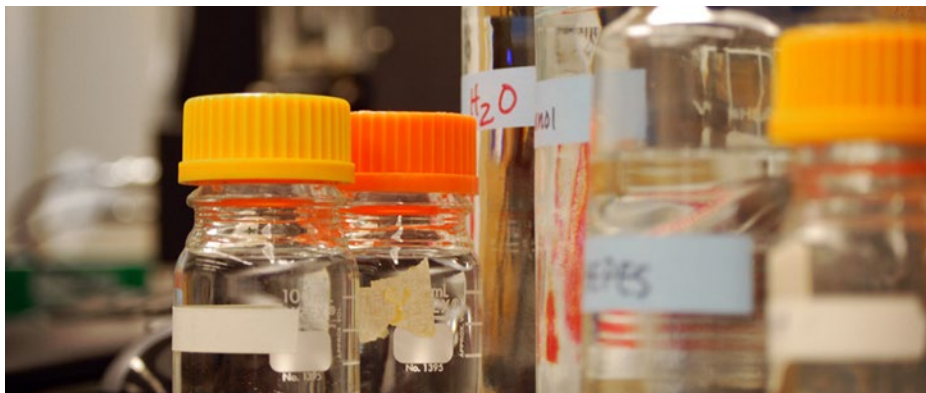
**9.9 Fourth-Year Requirement.** The 4<sup>TH</sup> year requirement involves meeting with one member of the advisory committee to discuss progress and plans. This requirement is designed to build a relationship with another faculty member other than your research advisor. The goals are to discuss the plan for completion of the thesis and to prepare for the next position beyond your PhD. A memo provided from the Graduate Office will need to be completed.



**9.10 Timeline for Submission of Thesis.** Graduate School regulations state that a student must submit and have received acceptance of the doctoral dissertation within seven years following admission to candidacy. The Department considers this to be the date of the Qualifying Examination typically in the 5<sup>th</sup> semester. If the examination is postponed to a later semester, the official date of the candidacy examination will be the last day of classes of the fifth semester of residency. The Qualifying Examination must be passed at least six months prior to the date of awarding the degree. Candidacy must be maintained even when the candidate is not in residence, by enrolling in G901 each semester or in research credits after the maximum six semesters of G901 have been exhausted. Failure to meet this requirement will automatically terminate enrollment in the degree program.

**9.11 45-Day Memo for PhD Defense Seminar.**

Students are required to complete the 45-day memo notifying Chemistry and Graduate School of the intended date of the PhD defense. The Graduate School has the right to reject your request for graduation with a PhD if this memo is not completed.



**9.12 Petition for Readmission.** A student whose enrollment in the PhD program has been terminated by failure to meet any of the requirements may petition the Graduate Standards Committee for readmission. This petition must be endorsed by at least one faculty member and must state the reasons for the request. The Graduate Standards Committee may grant or deny the request. In cases in which the petition is approved, the Graduate Standards Committee will set a maximum time for completion of the requirement. Approval of the Petition does not imply any further commitment by the Department toward financial support.

**9.13 Steps in Completing the Doctor of Philosophy Degree.** A checklist showing the timing and responsibility for steps in the attainment of the PhD degree are attached. A potential PhD candidate should refer to this list periodically to make sure all necessary actions have been taken. Failure to meet certain deadlines could mean a substantial delay in completion of the degree. Instructions for formatting and electronic submission of the PhD thesis can be found at the following websites:

- <https://graduate.indiana.edu/thesis-dissertation/formatting/doctoral.html>
- <https://graduate.indiana.edu/thesis-dissertation/submission/doctoral.html>

**STEPS TO THE DOCTOR OF PHILOSOPHY DEGREE IN CHEMISTRY**

Step	Individual or Office Responsible for Action	Step	Timing	Year
1	Student and Graduate Committee	Consultation for Program Planning	Beginning of first semester	1
2	Student	Choice of Research Advisor and Major Area	Preferably as soon as C500 is completed	
3	Student in consultation with Research Advisor	Formation of Advisory Committee	Before beginning of second year	

4	Student	Planning of courses with Advisory Committee	Before beginning of second year	
5	Student	Second Year Seminar Requirement	During third and fourth semester	2
6	Student	Completion of Coursework	Preferably by the end of second year unless classes aren't available	
7	Student	Present a research seminar to the Department	Fifth semester	3
8	Student and Advisory Committee	Qualifying Examination complete, approve and file Nomination of Candidacy & Nomination of Research Committee forms and a 1-2 summary of thesis proposal	Fifth semester	
9	DGS	Recommends Admission to Candidacy to the Graduate School and PhD Research Committee appointed	Upon completion of all degree requirements other than thesis; at least 8 months before degree can be completed	4
10	Student	4 <sup>th</sup> year requirement		
11	Student	Graduate Office on course requirements; removal of R and I grades	Early in the semester in which student plans to defend	5 (ideally)
12	Student	Submit first draft of thesis to Research Advisor  45-day memo and defense announcement e-doc due in Graduate Office	At least six weeks before thesis is due to Graduate School	
13	Student and Research Advisor	Submit unbound, revised thesis (copy approved by Research Advisor) to members of PhD Research Committee	Allow at least one month for committee approval	
14	Student and Research Advisor	Arrange Exit Seminar and Final Oral Examination; after confirming the date with Research Committee, notify the Graduate Office; NOTE: student must be registered at the time the degree is granted	At least six weeks prior to final oral examination and not more than seven years after step 9	
15	Student	Make room reservation for	At least six weeks prior to	

		Exit Seminar and Final Oral Examination in Graduate Office; complete and file examination announcement (sample available in Thesis Guide) with Graduate School	final oral examination and not more than seven years after step 9
16	Student	After announcement has been signed by Research Advisor, submit one copy to the Graduate Office	
17	Student	Submit a Seminar on Dissertation to the Department (Exit Seminar)	
18	Research Advisor	Chair Final Oral Examination, and for successful candidates, obtain signatures of Committee on thesis acceptance sheet and on one copy of 250-word Dissertation Abstract	At time of Examination
19	Student	File Dissertation Agreement for a microfilming and copyrighting contract. Pay fees to Bursar and present the receipt to Recorder of the Graduate School. Complete survey of Earned Doctorate and Graduate School exit survey. Also, bring a signed thesis acceptance page and signed thesis Abstract to Graduate School	By the 27 <sup>th</sup> of the month the student plans to graduate (except May and December)
20	Student	Make necessary corrections on all copies of thesis; submit dissertation electronically through ProQuest. <b>Have Copies bound for Faculty Advisor</b>	By the 15 <sup>th</sup> of the month the student plans to graduate (except May and December)
21	President (On recommendation of the Dean of the Graduate School)	Degree Awarded	Degrees awarded approximately one month after step 21 (degrees are awarded monthly)
22	Student	<b>Formal checkout, see Grad Program Coordinator</b>	



## 10. THESIS, EXIT SEMINAR, AND FINAL ORAL EXAMINATION

**10.1 Thesis.** The thesis is to be written after research has progressed sufficiently to constitute a genuine contribution to science. It must be of such quality that significant portions can be published in one or more of the leading journals in the subject field of research. The one deadline students need to adhere to is that **the PhD defense announcement goes to the Graduate School 45 days prior to their defense dates.** Failure to do so will likely result in the student needing to retake/reschedule the exam.

When nearing degree completion, the student should consult with their Research Advisor with regards to the format of the thesis and timeline for completion. Commonly, a Research Advisor will require at least two weeks to complete a review of the first draft. Afterward, extensive rewriting or even additional experimental work may be necessary so please plan accordingly. From this time until the final draft is ready, it may be necessary to consult with the advisor several times and to modify the developing thesis to achieve a fully satisfactory result. It is always recommended that the student seek advice regarding the writing of the document. Having the document carefully proofread will undoubtedly expedite the review process.

If the comments from your Research Advisor do not suggest the need for additional experimental work or rewriting, give a copy of the final draft to each member of the PhD Research Committee for their evaluation. **A copy of your final thesis draft should be submitted to each member of your PhD Research Committee a month before your Exit Seminar.** Each copy must be accompanied by a CV inserted at the end. These should be returned to the student no later than the day of the oral examination. Electronic copies are handled by ProQuest and will be placed in the University and Chemistry Department Libraries electronically (see Thesis Guide: <https://graduate.indiana.edu/thesis-dissertation/submission/doctoral.html>). The degree will not be awarded until the dissertation has been submitted electronically and the Graduate School finalizes it.

**10.2 Departmental Exit Seminar.** The candidate must present a departmental seminar on the dissertation prior to the final oral examination.

**10.3 Final Oral Examination.** The final examination constitutes primarily a defense of the thesis, but the PhD Research Committee or any other members of the graduate faculty in attendance may properly ask any questions judged by the Chair of the Research Committee (Research Advisor) to be relevant to the doctorate in chemistry. After the examination has ended, the Research Committee will decide whether to accept the thesis and recommend the awarding of the PhD degree.

## 11. DEPARTMENTAL MENTORING PLAN

In 2022, the College of Arts and Sciences reviewed the mentoring practices in departments and identified nine key features for holistic training. Faculty within the Department of Chemistry are committed to being effective mentors and review and revise practices regularly. Outlined here are the Department's response to those nine features identified by the College, outlining intentional actions to ensure these features are contained within our program.

**11.1 Program Timeline with Milestones.** See Section 1.11 for information about the 5-year PhD Culture. This timeline is shared with students during Orientation and reviewed in yearly class meetings. The major milestones that serve as checkpoints for students are outlined on the timeline and are described within the Graduate Handbook. Students may request an advising sheet from the Graduate Program Coordinator at any time to see their progress toward completing credits and courses for their degree.

## 5-year timeline to degree

	Year 1			Year 2			Year 3			Year 4			Year 5	
	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring
Semester number	1	2	-	3	4	-	5	6	-	7	8	-	9	10
Research	C500: Group selection	C500	Committee finalized											
Major/minor courses														
Professional development	C505		Rising 2 <sup>nd</sup> year meeting	2 <sup>nd</sup> year seminar (full cohort)	2 <sup>nd</sup> year (by area)	Rising 3 <sup>rd</sup> year meeting			Rising 4 <sup>th</sup> year meeting			Senior student meeting		
Qualifying exam														
4 <sup>th</sup> Year meeting with committee member														
PhD defense														
Teaching*														

\*There is great variability in the number of teaching semesters—from none to 5+ years of teaching, including summers. The amount of teaching depends on the funding your research advisor has, your eligibility for such funding, and your ability to secure fellowships. Also, some students opt to teach more as part of their career training or to strengthen their foundational knowledge. Faculty are encouraged to support senior students, and the department is only responsible for supporting students according to the terms of their offer letters. Students are responsible for doing their due diligence when selecting a research group in terms of typical teaching load and funds available for research.

**11.2 Building a Mentor Network.** C505 includes a purposeful discussion on the distinctions between a thesis advisor and a mentor. This discussion is followed with students then being asked to outline roles that they expect their thesis advisor to fulfill. As anticipated, this discussion leads to the conclusion that a network of mentors is needed for students to receive full scientific and professional training as different individuals will bring different strengths and be open to different types of discussions. This class discussion leverages the *3 Mentors* activity from [the Center for the Improvement of Mentored Experiences in Research](#) to help students identify their essential mentoring needs, leading to the conclusion that their needs may be different from other students. Students are strongly encouraged to keep the principle of a mentor network in mind throughout their career training as this process is ongoing. Networking strategies are discussed in the summer meetings with rising 4<sup>th</sup> year and senior class members as a review of this concept. [The Graduate Mentoring Center](#) is a good campus resource.

**11.3 Roles and Responsibilities of Students, Advisors, and Departments.** The Department leadership shares the [Guidelines for Advisor-Graduate Student Interactions in the College of Arts and Sciences, Indiana University](#) with its faculty each fall when students are going through the group selection process. In C505, the instructor leads a class discussion on *Aligning Mentor & Trainee Expectations* based on the module from the [Center for the Improvement of Mentored Experiences in Research](#) and shares the above-mentioned guidelines with the students. Departmental leadership uses the principles outlined in the guidelines when there are breakdowns in roles and responsibilities to promote a path toward resolution between faculty and students.

**11.4 Expectations of SAAs and their Faculty Supervisors.** Within the Department of Chemistry, SAAs are typically either AIs or RAs. When an AI, students are expected to follow the guidelines provided by the Department's [AI Manual](#). Faculty who oversee AIs are to follow the policies established by the Office of the Vice Provost for Faculty & Academic Affairs as outlined in the SAA contracts. At the end of the semester, faculty (or Departmental leadership when faculty are unavailable) are to provide feedback to the AIs with regards to their performance using the department form. When an RA, students and faculty are to follow the [Guidelines for Advisor-Graduate Student Interactions in the College of Arts and Sciences, Indiana University](#) as well as the policies established by the Office of the Vice Provost for Faculty & Academic Affairs as outlined in the SAA contracts. Students are to complete a self-assessment year, with faculty feedback as outlined in Section 11.9.

**11.5 Reporting Your Experience as a Graduate Student.** The Department of Chemistry conducts a Graduate Student Climate Survey on a 2-3 year basis, which provides an anonymous platform to provide feedback on all aspects of the graduate student experience within the program. The department also has an [anonymous portal](#) that students can use to provide feedback, and students are encouraged to provide feedback in person at any time through appointments with the DGS or members of the Diversity and Climate Committee for the Department. Students are also encouraged to bring information about their experiences to the Chemistry Graduate Representative Committee, which serves as their representatives to Departmental leadership.

**11.6 Graduate Student Association and Promoting Student Well-being.** Graduate students have formal representation within the Department of Chemistry through the Chemistry Graduate Representative Committee, which meets regularly with the DGS. They also assist in identifying representatives for the Department's Diversity & Climate Committee and Safety Committee. Students are encouraged to bring topics of importance to their well-being to the Committee as they have initiated a number of activities as well as policy and curricular changes in response to topics brought to their attention. In addition, the Chemistry Graduate Representative Committee hosts regular social events and professional development activities (Graduate Student Symposium, Career Development Symposium, Industry Matters) to promote student well-being. Students are encouraged to take advantage of campus resources to enhance their training and well-being as well, with resources discussed in both Sections 13 and 14.

**11.7 Conflict Resolution and Grievance Procedures.** Paths to conflict resolution and grievance procedures depend on the nature of the situation and whether the situation involves a student in an AI, RA, or exclusively student role (typically academic misconduct). Please see Section 13.4 for RA-related

situations and Section 13.7 for Research Misconduct. Please see Section 13.8 for AI-related situations. Please see Section 13.7 for student-related situations, including Academic Misconduct.

**11.8 A Curriculum of Professional Development.** Orientation and C505 serve as the Department's entry point into professional development broadly. The 2<sup>nd</sup> year seminar courses continue the tradition of professional development, with an emphasis on scientific communication and experimental design. These formal courses are augmented with yearly class meetings, where program requirements are reviewed along with timely discussion of professional development topics relevant to a student's stage in the program.

**11.9 Annual Evaluation.** In C505, students are introduced to the concept of an Individualized Development Plan (IDP) and engage in activities to establish SMART goals for their training. These activities prepare the students to complete an annual self-assessment based on the AAAS IDP, which is distributed each summer and focuses on Scientific Knowledge, Research Skills, Communication, Professionalism, Management/Leadership Skills, Responsible Conduct of Research, and Career Planning. This self-assessment is shared with the student's committee for feedback.

## 12. OUTSIDE ACTIVITIES, VACATION POLICY, PROFESSIONAL BEHAVIOR AND ATTITUDE, AND FREQUENTLY ASKED QUESTIONS

The guiding rules concerning work at the graduate level and beyond derive from the fact that each student is preparing for a professional career. The progress each student makes in their chosen profession will reflect natural aptitude for the field, the quality of training received, and the devotion with which they pursue their goals. **A career in chemistry is a demanding one.** Fields change rapidly and professional rewards go to the diligent and well-informed. Most individuals find that merely keeping up-to-date in their own specialties and attending to the routine tasks of their positions is at least a full-time task. It is unlikely that graduate students in the process of learning their field will find it any less time-demanding. Within this framework, both vacations and regular outside interests serve many useful functions. These activities must be viewed in the context of the whole picture, and a balance can be found between these activities of the individual and the professional demands of their research program.



**12.1 Vacation Policy.** There is no set guideline in the [Graduate Student Academic Appointees' guide](#) regarding vacation time, and this is generally set by agreement with the student's Research Advisor. The guiding rule for evaluating what vacation privileges are appropriate is what will fit reasonably into an overall program. Students should discuss expectations

when interviewing/rotating with potential research groups. Students should also consider their teaching assignments when scheduling vacations and **discuss any potential absences from teaching with the course instructor prior to making travel arrangements. Accommodations while teaching may or may not be possible depending on the structure of the course. First year students should not make any travel arrangement for winter break until after consulting with their research advisor; AI responsibilities must be completed prior to any departure and students must ensure that they are available in advance of the spring semester start on account of their AI responsibilities.**

**12.2 Parental Accommodation.** Students holding a College-funded fellowship or a student academic appointment (SAA) of at least 37.5 percent FTE, and who have completed a minimum of one semester (a



minimum of nine credits) in the College, are eligible for a (one-time) parental accommodation period up to six weeks. The accommodation period provides full release from SAA duties for six weeks. If you hold an instructional SAA, the College typically will cover the cost of hiring a replacement graduate assistant during a parental accommodation period. It is the program's responsibility to identify and appoint a replacement instructor. The College will not cover the cost of replacements for noninstructional SAAs. Please contact the department's Graduate Office—several months in advance of the birth, adoption, or foster placement—to learn more about the process.

**12.3 Drug Free and Harassment-Free Workplace.** Although the lines between academic and personal interactions are often heavily blurred in graduate school, the Chemistry Department expects professional behavior in the laboratory and classroom that is both compliant with drug-free workplace requirements of the university and funding agencies, and free of harassment. The Student Academic handbook includes the definition of harassment, and where to go if you feel that you are subject to harassment. <https://policies.iu.edu/academic/index.html>

## 13. WHEN THINGS GO WRONG/FREQUENTLY ASKED QUESTIONS

**13.1 Staying on Track.** Students are encouraged to be proactive in attaining their PhD in 5 years. This 5-year PhD culture is just that—a culture. It involves being aware of deadlines and having a realistic understanding of the Research Advisor's expectations for advancement to candidacy and defense of the PhD thesis. Graduate Students should seek out the advice of their Advisor and Research Committee every year to address plans to graduate in a timely manner. However, 5 years is a long period of time and sometimes unanticipated changes occur in a student's living situation or in their family, etc. Under such cases, it is important to discuss this change with the Research Advisor. When this change impacts the typical 5-year PhD timeline, the student is required to discuss this with the DGS who will re-assess the 5-year plan and provide suggestions for getting back on track or changing the track, e.g., to a 5-6 year track for 5 years + 6 months. Every student's story is different and this is reflected in the actual path that is followed through to successful defense of the PhD thesis.

**Q: I am feeling overwhelmed by graduate studies. What should I do?** Many students will experience a sense of being overwhelmed or burnout at some point during their graduate studies. There are many reasons for these feelings and how you should respond to them will depend on the specific situation. You are strongly encouraged to talk with friends, family members, your Research Advisor, the DGS, and other mentors for feedback. A diversity of perspectives can be incredibly valuable. Also, see Section 14 for professional mental health resources.

**Q: I feel like my research is going nowhere. What should I do?** Research is difficult and there will be periods of time when experiments simply don't work. Organize your data and talk with your Research Advisor and group members. Read literature broadly. Seek feedback from your Research Committee and graduate students from OTHER groups. Talk with scientific staff in the department. Attend seminars and talk with speakers about your work. Inspiration comes from many places... and sometimes, a change in projects may be needed.



**13.2 Unanticipated Coursework Problems.** Students are advised to follow the standard coursework track, but sometimes students are not prepared properly for the graduate-level coursework required for their degree. In this case, the students may be advised to drop the graduate course, take an incomplete (I), or take an undergraduate course for remediation purposes. In the event that this realization occurs too late in the semester to add the undergraduate course in concert with dropping the graduate course, students can maintain full-time status with a minimum of 6 credit hours, in accord with the College of Arts and Sciences policy. **Students encountering problems in**

**courses should discuss their challenges with the course instructor as well as with the DGS, who can provide guidance with regards to the impact of changes in coursework.**

**Q: What happens if I need to drop a class?** *Students have to maintain 6 credits to be a fulltime student. Depending on the time during the semester at which the class is dropped, a student may be able to add additional research credit to maintain full-time status. However, if adding additional credits is not possible, a student's timeline to candidacy may be delayed. Students should discuss this option with the DGS.*

**Q: When would taking an Incomplete be appropriate?** *This option is only available if a student has a passing grade in a course. It is a mechanism to assist students who have encountered medical or personal issues that may be prohibiting them from completing the course. The terms of the incomplete will be set by the DGS and course instructor. This path does not modify a student's credit hours.*

**Q: What happens if I receive a C- or lower in a graduate course?** *Courses with a grade of C- or lower do not count toward degree requirements and will delay when you reach G901 status (see section 1.2 for more information on G901). You will either have to retake or replace the course, achieving a grade of a C or higher.*

**Q: What happens if my GPA drops below a 3.0?** *The College of Arts and Sciences (COAS) will place you on academic probation. COAS will work with the DGS to outline the terms of the probation, providing a timeline by which the GPA must be brought above a 3.0 in order to stay within the program.*

**Q: What if a course I want to take isn't available until my third year in the program?** *Students can complete their coursework at any time during their 3<sup>rd</sup> year and still take their Qualifying Exam in their 5<sup>th</sup> semester. The paperwork associated with entering candidacy will be held until classes are complete; this typically does not alter the timeline at which a student reaches G901 status.*

**13.3 Change of Major.** Students wishing to change their major after joining the program should get a form from the Graduate Office to formalize the change.

**13.4 Conflicts with Research Advisor.** Given the important role of the Research Advisor in the career development of the student, conflicts between student and Advisor can seem particularly difficult. Students in this situation are advised to consult a member of their Advisory/Research Committee or the DGS to discuss possible means to overcome conflicts or difficulties. The Department Chair may also be consulted when there is a Conflict of Interest with the DGS. If the student feels more comfortable with discussing issues OUTSIDE of the Department, Prof. Elizabeth Cullen Dunn, Geography, is the designated Associate Dean for Graduate Education, and can be contacted for consultation.

**Q: What happens if I want to change Research Advisors (at the end of C500)?** *You should interview with 3-4 faculty to identify a new Research Advisor by the end of May.*

**Q: What happens if I want to change Research Advisors (after the C500 period)?** *Students should schedule a confidential meeting with the DGS to discuss options. Assuming the student is in good academic standing, they will inform their current advisor of their intention to switch groups, then they will interview 3-4 faculty to identify a new Research Advisor. Once an agreement has been made with a new Research Advisor, students need to complete a change-in-advisor form. Delay in the timing of a student's Qualifying Exam will be decided between the new Research Advisor and the DGS. If a student has already reached candidacy, they may be required to retake the Qualifying Exam with the new Research Advisor.*

**Q: What rights do I have if my Research Advisor no longer wants to support me in their group?** *Students in this situation should arrange for a confidential meeting with the DGS. Typically, an appropriate time period will be given for a student to identify a new Research Advisor; a student must be associated with a Research Advisor to stay in good academic standing. Students without a research advisor will be given ~3 weeks to identify a new advisor before being placed on probation, which establishes terms for dismissal from the program.*

**Q: If my Advisor and I disagree about the scope of research needed to complete a MS or PhD or the timeline for degree completion, what do I do?** It is important to realize that degrees are not granted based on the time in the program but rather the quantity and quality of research completed and compiled within the thesis as well as one's readiness for independent degree-level research/responsibilities. Students with disagreements are advised to seek feedback from their committee members as ultimately the full committee makes the degree recommendation.

**Q: What if I need to leave for a job before degree completion?** The department strongly discourages any student from leaving before their thesis has been finalized as it is common for students to have revisions that include experimental additions to their thesis. Thus, any student relocating from Bloomington before degree completion must complete a Degree Completion Plan, with input from their advisor/committee/DGS and submit the document to the Academic Office before leaving town. While a non-binding document, this worksheet is to establish the student's responsibilities toward their degree completion.

**13.5 Leave of Absence.** If personal illness or other family/personal situations arise during the course of study that disrupts one's ability to undertake program requirements, students can apply for a leave of absence. Forms can be found at the following links. The Graduate Coordinator can assist with filling out the forms: <https://college.indiana.edu/student-portal/graduate-students/leaves-absence.html>

**13.6 Dismissal From and Reinstatement to the Program.** There are several reasons a student may be dismissed from a program, including protracted academic probation, failure of the candidacy examination, or destructive behavioral issues. The procedure involved in reinstatement to the program is described in the University Graduate Bulletin and is as follows: (1) obtain the permission of the Departmental Chairperson, (2) fulfill the Departmental requirements in effect at the time of the application for reinstatement, (3) pass the current PhD Qualifying Examination or its equivalent (defined in advance), and (4) request reinstatement to candidacy from the Dean. The reinstatement, if granted, will be valid for a period of 3 years, during which time the candidate must enroll each semester for a minimum of 1 credit.

**13.7 Academic and Research Misconduct.** If a graduate student is suspected of academic misconduct, procedures outlined by the Office of Student Conduct are to be followed. If a graduate student is suspected of engaging in research misconduct, procedures outlined by the Office for the Vice Provost for Research are to be followed; if the activities were conducted while the student was enrolled in research credits, academic sanctions from the Office of Student Conduct may also be applied. Sanctions for academic and research misconduct can range from a warning to dismissal from the program depending on the nature of the action. (See page 3.)



**13.8 Unsatisfactory Performance as AI Appointment.** If an AI is not performing up to expectations established by the instructor, this sets in motion the following process.

- Course instructor arranges a face-to-face, one-on-one meeting with the AI to discuss performance issues. The instructor will follow up with an email to the AI, documenting both the reason for the meeting, and any specific plan for improving the situation.
- The AI's Research Advisor and the DGS are notified at once of this meeting, for information purposes. The Research Advisor is encouraged to intervene with the student proactively to correct performance deficiencies.
- If performance deficiencies persist, the DGS will meet with the student to discuss the possibility of dismissal from the AI appointment. The student's Research Advisor is informed of the possibility that support may shift from AI to RA support. If RA support is not available, dismissal



from the program can occur.

- Severe cases of misconduct or failure to cooperate in efforts to improve the situation may result in termination of their SSA appointment (which includes both AI and RA appointments).
- If a student is terminated, they have 14 days from the written notice of termination to allow time for an appeal in writing. The written appeal must include the reasons why the student feels the termination is unjustified. The College then convenes a hearing board to rule on the appeal.
- Please see the SAA handbook for the appeal procedures and other details about student academic appointments (RA and AI): <https://bfc.indiana.edu/policies/saa-grievances.html>



**Q: How can I improve my teaching?** There are many strategies to improve your teaching. Please consult the Center for Innovative Teaching and Learning (Section 14.6) for workshops, discuss classroom challenges with your course instructor/lead AI/DGS, and shadow more experienced AIs to see how they are effective in the classroom, among other strategies. Also, gather anonymous feedback from your students about what is working and where they would like to see improvement—this feedback is very valuable to gather at approximately 1/3-1/2 way through a semester.

**Q: How are AI assignments determined? Can I select my AI assignment?** AI assignments are determined based on scientific expertise, schedules (class/group meeting/seminars, etc.), faculty request, and past teaching performance. An optional survey will be emailed to AIs in November and April to capture their teaching preferences. Please note: Not all requests can be honored due to the difficulty associated with balancing scientific expertise and schedules.

**Q: My teaching assignment is taking all my time. What should I do?** Most AI appointments are for an average of less than 20 hours of work per week; this time may include preparation for and attendance at your class section, attendance at class lectures and AI meetings lead by course instructor/head AI, grading, and office hours. Track your time. Is your assignment really taking more than the anticipated time? If yes, which responsibility is causing this excess? Often students will cite grading. Make sure to remove distractions when grading and talk with your course instructor on how to be more efficient in your grading while still providing feedback.

**Q. What can I do if my AI assignment is taking longer than 20 hours per week or the course instructor is giving me a greater responsibility than other AIs?** Document your responsibilities and the time that they are taking and talk with either the course instructor or the DGS. Modifications can be made when assignments are found to be out of alignment with the SAA contract.

**Q. What can I do if my course instructor or educational support staff isn't treating me professionally/with respect?** We encourage students to bring concerns directly to the instructor or staff whenever possible, doing so in a professional and constructive manner by considering what changes in treatment one would like to experience. Students can also bring concerns to the DGS who may provide advice or talk with the instructor/staff depending on the situation.

**Q: Why don't all graduate level courses have an AI? How are AI appointments determined in graduate level courses?** The university budget does not provide for an AI in all graduate level courses. Each area within the department has at least one ¼ AI per year that can be allocated to a graduate level course. This allocation is decided by the faculty coordinator for that area in consultation with those faculty



teaching graduate level courses. This decision is made in the summer before the start of a new academic year. Typically the course instructor will select the AI based on scientific expertise. All graduate courses without an AI are eligible for an hourly graduate teaching assistant who can assist both the course instructor and students up to 9 hours weekly. These assistants receive an hourly wage on top of their regular stipend and typically are graduate students on an RA appointment. Federal law prohibits international students and those students supported on fellowships from serving as an hourly graduate teaching assistant.

## 14. CAMPUS RESOURCES

**14.1 University Graduate School.** University-level oversight of all graduate programs. Provides useful links on preparing your thesis, university policies, and resources that include your health insurance, benefits, childcare, and more: <https://graduate.iu.edu/> Wells Library, 5<sup>th</sup> Floor, 812-855-8853.

**14.2 Counseling and Psychological Services (CAPS).** The University offers resources for students having experiences with depression, anxiety, and related conditions. See the following link for available services: <https://healthcenter.indiana.edu/counseling/> To support graduate students further, the department has a Counselor in Residence. This individual understands our program and the demands placed on STEM students. To arrange meetings with her, please call CAPS and request Melissa Anderson or the Chemistry Counselor in Residence and they will setup your appointment with her – she also holds periodic workshops.

**14.3 Graduate Mentoring Center.** Provides professional development opportunities for graduate students as well as hosts mindfulness activities: <https://graduamentoringcenter.iu.edu/>

**14.4 Student Health Center.** A full-service health center, including for assistance with substance use: <http://healthcenter.indiana.edu/>

**14.5 Title IX Office.** Addresses sexual misconduct, including gender-based harassment: <https://stopsexualviolence.iu.edu/employee/title-ix.html>

**14.6 Center for Innovative Teaching and Learning (CITL).** Provides workshops and training in pedagogy, including graduate-student focused workshops: <https://citl.indiana.edu/>

**14.7 Writing Tutorial Services.** Provides assistance in writing: <https://wts.indiana.edu/>

**14.8 Office of International Services.** Provides resources for international students: <https://ois.iu.edu/> Poplars Building, Rm. 22, 2<sup>nd</sup> Floor, 812-855-9086.

**14.9 Office of the Vice President for Diversity, Equity, and Multicultural Affairs.** A centralized resource for diversity efforts at IU, including oversight of the Cultural Houses (e.g., Asian Cultural Center, First Nations Educational and Cultural Center, LGBTQ+ Culture Center, La Casa, Neal-Marshall Black Culture Center): <https://diversity.iu.edu/>

**14.10 Bursar.** <https://studentcentral.indiana.edu/pay-for-college/pay-bill/index.html>

**14.11 Graduate and Professional Student Government (IU GPSG).** The IU-Bloomington Graduate and Professional Student Government that represents all graduate students

**14.12 Police.** **Bloomington Police:** 220 E. Third Street, 812-339-4477  
**IU Police:** 1469 E. 17<sup>th</sup> St., 812-855-4111

**14.13 Registrar.** <https://registrar.indiana.edu/> 408 N. Union Street, 812-855-6500. Student Inquiries: [scu@indiana.edu](mailto:scu@indiana.edu)

**14.14 Crimson Cupboard.** Crimson Cupboard offers free food to IU Bloomington students who cannot otherwise afford it. Stocked by donations and staffed by volunteers, this special food pantry lessens the effects of poverty and food insecurity in our community. Located in the Campus View Apartments, 800 N. Union Street, 812-855-1924. <https://studentaffairs.indiana.edu/student-support/crimson-cupboard/index.html>

**14.15 Student Legal Services.** <https://studentaffairs.indiana.edu/student-support/legal-services/index.html>

**14.16 MoneySmarts.** Campus resources to assist students achieve financial wellness. <https://moneysmarts.iu.edu/>