

Chemistry Graduate Student Handbook
revised April 2009



University of Louisville
Department of Chemistry



UNIVERSITY of LOUISVILLE
dare to be great

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Minimum Admissions Criteria

Students seeking a graduate degree in chemistry should meet these minimum requirements:

1. A B.A. or B.S. degree in chemistry or in a related field. Students should have a chemistry background equivalent to 36 hours of undergraduate coursework. Students with inadequate preparation may be admitted with conditions.
2. A minimum quality point standing of 3.0/4.0.
3. Graduate Record Examination quantitative and verbal scores totaling at least 1000 with an analytical score of 2.5.
4. At least two letters of recommendation. It is recommended that the letters be written by someone who can speak to the applicant's academic and/or professional capabilities.
5. A personal statement addressing specific issues pertaining to knowledge, work and/or research experiences, goals, and/or interests in the chosen field of study.
6. If English is not the student's primary language, a TOEFL score of 77 or higher on the internet based TOEFL, 210 or higher on the computer-based TOEFL, or 547 or higher on the paper based TOEFL is required. Successful completion the Intensive English as a Second Language Program at the University of Louisville may substitute for the TOEFL. Approval from the University of Louisville International Center of financial resources adequate to support educational and living expenses in the United States for the duration of graduate studies is also required. The award of a University Fellowship or Graduate Assistantship is considered evidence of adequate financial resources.

Applications for Fall admission should be submitted before January 15 to receive full consideration for all Fellowship and Graduate Teaching Assistantship (GTA) opportunities. Applications received after this date will not be eligible for fellowships, but will be considered for GTA positions. Applications for Spring admissions should be submitted by September 15. Spring applicants will be considered for a limited number of GTA positions. Students not admitted for Spring may request to have their application consider for Fall.

Admissions decisions will only be made once a complete application has been received. A complete application includes the following items:

1. A completed online application: graduate.louisville.edu/apply
2. Official transcripts showing all degrees awarded and all undergraduate and all graduate work completed at all colleges/universities previously attended. All transcripts that are not in English must be translated verbatim into English and must be notarized. International applicants may be required to have transcripts evaluated by a credential evaluation service such as World Education Services (www.wes.org) or Educational Credential Evaluators (www.ece.org)
3. Official GRE scores
4. A minimum of 2 recommendation letters
5. Personal statement
6. Application fee
7. Official TOEFL scores (international applicants)

Please contact Sherry Nalley to check on the status of your admission application.

Requirements for Doctor of Philosophy in Chemistry

A minimum total 30 semester hours of graduate credit is required. At least 15 semester hours must be in chemistry courses. An overall GPA of 3.0 must be maintained.

- Courses** Students must pass a minimum of 6 graduate lecture courses from at least 3 of 6 divisions (Analytical Chemistry, Biochemistry, Inorganic Chemistry, Organic Chemistry, Physical Chemistry, and Physics) with a minimum grade of 'C' in any one course during the first 4 semesters (excluding summers). Up to 2 courses may be waived for students entering with a M.S. degree in chemistry (or a closely related field with consent of the Chemistry Director of Graduate Studies). For each course waived, the student must receive an A- or higher in a graduate chemistry lecture course at the University of Louisville.
- Mentor** The research mentor should be selected during the first semester. Students are required to interview a minimum of 5 chemistry faculty, including members of at least 2 divisions, and have them sign the Mentor Selection Form. The student may choose a mentor after obtaining 5 signatures. If the mentor agrees to accept the student, the mentor will again sign the Mentor Selection Form and the student should submit it for approval by the departmental Director of Graduate Studies. Students wishing to change research directors should first consult with the departmental Director of Graduate Studies. Failure to actively participate in a research group is grounds for loss of funding and/or dismissal from the program.
- Committee** The student will select his/her Dissertation Committee in consultation with the research director during the first 4 semesters of study. The committee consists of the research mentor, a chemistry faculty in the same division, a chemistry faculty in a different division, an additional chemistry faculty, and a faculty member from a different department. Students must have each committee sign the Dissertation Committee Form and submit it the chemistry office.
- Cumulative Exams** Students must complete a series of written cumulative examinations designed to show in-depth knowledge in the chosen area of concentration. Cumulative exams begin in the second semester and are given the second week of January, March, May, September, and November. Each division with students actively taking cumulative exams will write its own exam. Student's may take any available exam, but may only take one exam per month. Exams are scored as 0, 1, 2, or 3 points. Students must accumulate 12 points by the end of the 10th consecutive exam to qualify for the Ph.D. program. A missed exam is scored as 0 and constitutes an attempt. Students who fail to accumulate 12 points by the end of the 10th exam will be placed in the M.S. program.
- Literature Seminar** Students must enroll in seminar (Chem 695) during their first 4 semesters (excluding summers). Students enrolled in CHEM 695 must attend seminars and make a presentation during their second or third semester. The seminar attendance requirement may be waived after all other candidacy requirements have been achieved.
The literature seminar should be based on a topic under active discussion in the recent literature. The student is responsible for selecting the seminar topic, although consultation with the student's research advisor is recommended to

verify that the independently chosen topic is appropriate. The topic must not be chosen from the student's immediate area of research and must not be chosen from an area over which a comprehensive review has been published during the previous two years. The topic must be approved by the Seminar coordinator and/or the Seminar Committee. The student must fully develop the topic, integrating material from at least three primary references and a total of at least eight references into a flowing, well-organized presentation of appropriate length. A passing grade for seminar is B- or above. A student who does not attain this grade will be allowed one attempt to repeat the seminar. The second attempt must be completed prior to the end of the student's 4th semester. Failure to receive a B- or higher on the second attempt will result in dismissal from the program. Additional information will be provided on the Chem 695 syllabus.

Research Proposal

The research proposal (RP) is intended to demonstrate the student's ability to develop, explain, and defend research ideas. The proposal may present preliminary results from the student's research and it describes possible future directions. This is not necessarily the work the student intends to complete for their dissertation. Students are encouraged to show their originality and innovation. The research proposal must be completed prior to the beginning of the 7th semester (excluding summers). Evaluation of the RP is made by the student's graduate advisory committee, which is chaired by the research director.

The RP consists of a written proposal, an oral presentation, and oral examination. The written portion is to be submitted to the committee at least one week prior to the oral portion. The committee may return unsatisfactory written proposals to the student and delay the oral portion until at least one week after an acceptable rewrite is received. A student failing the oral portion may repeat it only one time, at the discretion of the student's graduate advisory committee.

Guidelines: *The following guidelines are general recommendations only. Expectations of individual members of the student's graduate advisory committee will vary. Students are strongly encouraged to discuss specific requirements with their research director and graduate advisory committee members prior to submitting the written proposal.*

Written Portion: Treat the written proposal as if you were actually submitting it as part of a job application or for funding. In reality, proposal length requirements vary by situation and the funding source. Academic positions may require 3-5 pages describing 2 research projects, small grants may require 5-7 pages, whereas NSF and NIH grants will be longer. *Consult your research mentor for length restrictions.*

The written proposal should *clearly* and *concisely* present your proposed research and why it should be *funded*. This should include an introduction to outline the problem, why it is important, and what progress others in the field have made. It should state a hypothesis that your planned work will test and specific aims of the research. The proposal should describe what will be done, why this system was selected, how it will be done, what are the expected

results, how success will be determined, and what are the benefits if successful. The proposal should be well referenced in the style of a major journal in your field. Carefully proofread your proposal and have a trusted friend proofread it as well. Typos, poor grammar, low quality graphics, and "simple mistakes" detract from your scientific argument and make the work appear sloppy, disorganized, and of low quality.

Oral Portion: Treat the oral presentation as if the written proposal was submitted with a job application and you were called for an interview to present it. Do not assume that everyone knows the proposal as well as you, they don't. It is your responsibility to present the proposed work in clear and fluid way to an audience that is not intimately familiar with your proposal. The presentation should be professional. Expect frequent interruptions during your presentation and be prepared to answer questions on your proposal, techniques related to it, and contributions of others in the field.

Publications	It is normally expected that prior to the Research Seminar, at least one manuscript based on the student's research would have been submitted to a peer-reviewed journal. The student's contribution must be substantial to both the scientific content and the drafting of the manuscript. Before completion of the Ph.D. program, at least one published article and at least one additional manuscript submitted to peer-reviewed journals are expected. It is highly recommended that the student distribute the submitted manuscript(s) to the members of her/his Dissertation Committee.
Research Seminar	A one-hour seminar on the student's dissertation research project is to be given before the end of the 8 th semester (excluding summers). This seminar does not require the student to enroll in Chem 695, but the student should contact the CHEM 695 instructor to schedule a time and date and for evaluation criteria. The seminar will be judged as pass/fail. The MS degree will be awarded upon successful completion of the research seminar.
Research	Progress in research will be evaluated by the research mentor in consultation with the dissertation committee.
Dissertation	A written dissertation describing the research program is submitted a minimum of 14 days before the defense. The defense consists of a one-hour seminar followed by an oral examination with the Faculty Reading committee.
Candidacy	A student may enter Master's candidacy after successfully completing all lecture course requirements, the literature seminar, and accumulation of at least 30 credit hours. After admission into candidacy, the student must enroll for candidacy (and only candidacy) every semester (including summers) until graduation. Students may enter Ph.D. candidacy upon completion of the Research Seminar and receipt of their M.S. degree. <i>Students must be enrolled for Ph.D. candidacy a minimum of 9 months prior to graduation.</i>

Requirements for Master of Science in Chemistry

A minimum total 30 semester hours of graduate credit is required. At least 15 semester hours must be in chemistry courses. An overall GPA of 3.0 must be maintained.

- Courses** Students must pass a minimum of 4 graduate lecture courses from at least 3 of 6 divisions (Analytical Chemistry, Biochemistry, Inorganic Chemistry, Organic Chemistry, Physical Chemistry, and Physics) with a minimum grade of 'C' in any one course during the first 4 semesters (excluding summers).
- Mentor** The research mentor should be selected during the first semester. Students are required to interview a minimum of 5 chemistry faculty, including members of at least 2 divisions, and have them sign the Mentor Selection Form. The student may choose a mentor after obtaining 5 signatures. If the mentor agrees to accept the student, the mentor will again sign the Mentor Selection Form and the student should submit it for approval by the departmental Director of Graduate Studies. Students wishing to change research directors should first consult with the departmental Director of Graduate Studies. Failure to actively participate in a research group is grounds for loss of funding and/or dismissal from the program.
- Committee** The student will select his/her Thesis Committee in consultation with the research director during the first 4 semesters of study. The committee consists of the research mentor, a chemistry faculty in the same division, a chemistry faculty in a different division, an additional chemistry faculty, and a faculty member from a different department. Students must have each committee sign the Dissertation Committee Form and submit it the chemistry office.
- Literature Seminar** Students must enroll in seminar (Chem 695) during their first 3 semesters (excluding summers). Students enrolled in CHEM 695 must attend seminars and make a presentation during their second or third semester. The seminar attendance requirement may be waived after all other candidacy requirements have been achieved.
- The literature seminar should be based on a topic under active discussion in the recent literature. The student is responsible for selecting the seminar topic, although consultation with the student's research advisor is recommended to verify that the independently chosen topic is appropriate. The topic must not be chosen from the student's immediate area of research and must not be chosen from an area over which a comprehensive review has been published during the previous two years. The topic must be approved by the Seminar coordinator and/or the Seminar Committee. The student must fully develop the topic, integrating material from at least three primary references and a total of at least eight references into a flowing, well-organized presentation of appropriate length. A passing grade for seminar is B- or above. A student who does not attain this grade will be allowed one attempt to repeat the seminar. The second attempt must be completed prior to the end of the students 4th semester. Failure to receive a B- or higher on the second attempt will result in dismissal from the program. Additional information will be provided on the Chem 695 syllabus.

- Publications: It is normally expected that prior to the thesis defense at least one manuscript based on the student's research would have been submitted to a peer-reviewed journal. The student's contribution must be substantial to both the scientific content and the drafting of the manuscript.
- Research Progress in research will be evaluated by the research mentor in consultation with the thesis committee.
- Thesis A written thesis describing the research program is submitted a minimum of 14 days before the defense. The defense consists of a one-hour seminar on the thesis project followed by an oral examination with the Faculty Reading committee.
- Candidacy A student may enter candidacy after successfully completing all lecture course requirements, the literature seminar, and accumulation of at least 30 credit hours. After admission into candidacy, the student must enroll for candidacy (and only candidacy) every semester (including summers) until graduation. Students in candidacy are not permitted to enroll in lecture courses, seminar, or research.

Registration Procedures

Registration for all academic units within the University is coordinated by the Registrar's Office, in cooperation with the respective Dean's Offices. A schedule of courses being offered for the upcoming year, along with the academic calendar, can be found at: <http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>

Prior to registration, the student should consult with his/her research mentor or the director of graduate studies. After courses have been selected, the student should register by the procedure outlined in the Schedule of Courses. The Unit Business Manager, Susan Dewitt, can help to alleviate difficulties which arise during registration.

Graduate students must be registered as full-time students to receive stipends or fellowships. Students must register for courses OR be in candidacy to be considered full-time. A minimum of nine credit hours during Fall and Spring semesters and six credit hours in the Summer is required to be considered full-time. All students must register for research as needed to maintain full-time status. NOTE: Chem 691, 692, and 695 DO NOT count towards the course requirements. A maximum of twelve credit hours can be taken in a given semester. Students on University Fellowships must enroll for twelve credit hours during the Fall and Spring semesters and for nine credit hours during the Summer term. Students wishing to take more than the maximum number of hours must obtain the permission from the Director of Graduate Studies and the Dean's Office. For students in candidacy, they must register as a candidate every semester (including summers).

Courses

A list of potential courses offered by the Chemistry Department is given below. Please consult online schedule of classes or the chemistry office for a list of actual offerings. For clarity the list is presented according to the Division of Chemistry offering the course. Note that students must take graduate courses from a minimum of 3 divisions. Graduate courses are numbered 550 or greater to count for graduate credit.

Analytical Division

Chem 620	Optical Spectrochemical Methods of Analysis
Chem 621	Electroanalytical Chemistry
Chem 622	Analytical Separations
Chem 623	Advanced Chemical Instrumentation
Chem 625	Advanced Analytical Chemistry
Chem 629	Special Topics in Analytical Chemistry

Biochemistry Division

Chem 645	Modern Biochemistry I
Chem 647	Modern Biochemistry II
Chem 684	Biophysical Chemistry

Inorganic Division

Chem 550	Group Theory and its Chemical Applications
Chem 653	Main Group Chemistry
Chem 654	Advanced Coordination Chemistry
Chem 655	Special Topics in Inorganic Chemistry (Fall Semester)
Chem 656	Special Topics in Inorganic Chemistry (Spring Semester)

Organic Division

Chem 557	Bio-Organic Phenomena
Chem 670	Chemistry of Heterocyclic Compounds and Alkaloids
Chem 675	Special Topics in Organic Chemistry (Fall Semester)
Chem 676	Special Topics in Organic Chemistry (Spring Semester)
Chem 678	Advanced Physical Organic Chemistry
Chem 679	Advanced Synthetic Organic Chemistry

Physical Chemistry Division

Chem 561	Advanced Physical Chemistry
Chem 576	Polymer Chemistry (occasionally offered)
Chem 661	Chemical Thermodynamics
Chem 666	Special Topics in Physical Chemistry (pre-requisite: Chem. 561)
Chem 672	Quantum Chemistry (pre-requisite: Chem. 561)
Chem 684	Biophysical Chemistry (pre-requisite: Chem. 561)
Chem 687	Molecular Spectroscopy (pre-requisite: Chem. 561)

Physics

Phys 605	Theoretical Mechanics
Phys 611	Electromagnetic Theory I

The following courses are not offered by a specific division or are common to all divisions. Chem 651 and 652 can count towards the course requirements with approval of the Chemistry Department Director of Graduate Studies.

Chem 632	Chemical Education
Chem 651	Independent Study (Fall semester)
Chem 652	Independent Study (Spring semester)
Chem 688	X-ray Crystallography
Chem 691	Research (Fall semester)
Chem 692	Research (Spring semester)
Chem 695	Seminars

Graduate Student Guidelines

Financial Support

Financial support for full-time graduate students may be in the form of a Graduate Teaching Assistantship (GTA), Graduate Research Assistantship (GRA), or Fellowship. Financial support includes a stipend, health insurance benefits, and tuition remission. All administrative problems with salary or tuition should be reported to Susan Dewitt in the Chemistry Office. To receive financial support, a student must meet four eligibility requirements. The student must maintain good academic standing, the student must make normal degree progress, the student must satisfactorily complete any GTA obligations, and the student must not exceed the funding time limit.

Good academic standing requires a minimum overall GPA of 3.0 for all graduate courses (including research and seminar). If a student's GPA falls below 3.0, the student will be placed on academic probation for the next semester (excluding summers). A student on academic probation must meet with the Director of Graduate Studies and his/her Advisory Committee to discuss a suitable plan for remediation. If the student's GPA improves to 3.0 or higher by the end of the probationary semester, the probation will be lifted. If the student fails to attain a GPA of 3.0 or higher by the end of the probationary semester, the student will be dismissed from the program.

Normal degree progress is defined as active participation in a research group and satisfactory completion of the following milestones according to the timelines established in this handbook: coursework, literature seminar, cumulative exams, research proposal, research seminar.

Students with GTA obligations must adhere to the following guidelines and responsibilities:

1. All GTAs are required to be present and available in the department one full week before the first day of classes in order to receive and respond to messages, attend meetings, and to execute other duties associated with their assignments. Messages and information to GTAs may be emailed or placed in departmental mailboxes. E-mail contact does not fulfill the requirement for presence and availability. A GTA may check with their assigned Senior Instructor for advance duties. However, reassignments are possible and GTAs must be able to respond on short notice. Failure to meet these obligations constitutes unsatisfactory completion of GTA obligations.
2. Each GTA must present and fully prepared for each assigned laboratory or recitation sections. For laboratory assistants, preparation includes having chemicals and instrumentation ready for each experiment at the beginning of the period. For recitation instructors, preparation includes reading assigned chapters and working through all assigned problems, quizzes and exams. Each section must start and end on time including time for laboratory clean-up. If the assistant is unable to meet a section for any reason, it is his/her responsibility to inform the Senior Instructor of the course so that a replacement can be found to meet the section. If the Senior Instructor cannot be reached, the name of a replacement must be left with a staff member in the chemistry office (6798).
3. Each GTA must provide a complete schedule to the Senior Instructor of the course to facilitate setting of office hours and proctor/grader assignments. In some cases, the GTA may be required to attend class lectures. Any changes in schedule must be promptly reported to the Senior Instructor.

4. Each full-time GTA must set aside two office hours per week to answer course-related questions from any student enrolled in the course. The time and place where office hours will be held must be promptly announced at the beginning of the semester.
5. Course-specific guidelines concerning grading and policies will be issued by the Senior Instructor and must be followed. All grading must be completed according to the procedures and schedules established. No alterations or deletions are to be made without the consent of the Senior Instructor.
6. In cases where grades are to be recommended by the GTA, the grading methods will be established by the Senior Instructor. The grading criteria must be conveyed by the GTA to the students at the beginning of the semester. Grades and related materials are private and confidential. Graded materials cannot be left out for public inspection, and the GTA must not reveal the grades of one student to another.
7. Each GTA must be read and act accordance with the Code of Student Rights and Responsibilities, the Code of Faculty Responsibilities, and the College of Arts and Sciences Statement of Academic Discipline.
8. Each GTA must follow all University safety regulations and other safety instructions provided by the Senior Instructor. Safety instructions must be given to the students by the graduate assistant and policies strictly enforced.
9. The GTA is expected to be fluent in the English language and to possess good communication skills.
10. Students supported as a GTA are not permitted to accept other employment without written consent of the Department Chair and Dean's Office.

Ph.D. students are eligible for departmental funding for a period not to exceed 10 semesters (excluding summers) from the date of entering the chemistry program. Ph.D. students may appeal in writing to the Director of Graduate Studies for one additional semester of funding. The Director of Graduate Studies will consult with the departmental graduate admissions committee in reviewing all appeals. M.S. students are eligible for departmental funding for a period not to exceed 5 semesters (excluding summers) from the date of entering the chemistry program. Any student may request an unpaid leave of absence at any time. Any leave granted must carry with it a stipulation in writing as to whether the leave counts toward the funding time limit.

Tutoring

Graduate assistants may tutor undergraduate students as a means of supplementing their stipend with certain restrictions. Under no circumstances shall the GTA tutor a student in his/her lab or recitation section or another section of the same course. Tutoring must not conflict with teaching or research obligations.

Safety

The Safety Director for the Department of Chemistry, Dr. Bill Richmond (0730), acts as the liaison with the University Department of Environmental Health and Safety (DEHS, 6670) and enforces government regulations as they pertain to hazardous materials and safety (eg. OSHA). Graduate students are required to attend a presentation dealing with safety issues as well as a training session on hazardous waste treatment procedures (DEHS). **These sessions are mandatory and are typically included in the new student orientation.** Students are also required to read both the Department and University Safety Manuals, copies of which can be found in research laboratories or obtained from Dr. Richmond. GTAs will receive an additional course specific safety training from the senior instructor.

Chemistry Graduate Student Association (CGSA)

The CGSA is the duly constituted member of the Student Government Association which represents students enrolled in the graduate program of the Chemistry Department of the University of Louisville. The CGSA is organized by the chemistry graduate students for the purpose of providing an official body to represent the chemistry graduate students to both the Chemistry Department Faculty and to the University. The aims of this association are to discuss the needs and problems of the chemistry graduate students, to inform students of their rights and responsibilities, and to protect the chemistry graduate students' rights and privileges. Present functions of the CGSA include securing travel money from the GSC for graduate students to attend professional meetings, organizing a welcoming picnic for new graduate students each fall, and organization of a Distinguished Lecture Series.

The officers of the CGSA are President, Vice-President, Secretary-Treasurer, and a CGSA representative to attend mandatory meetings of the Student Government Association (SGA) and the Graduate Student Council (GSC). Two CGSA officers may also attend meetings of the Chemistry Faculty. The officers, along with a faculty advisor, are elected annually during the spring semester of the academic year. The names of current officers may be obtained from the Chemistry Department office, and a copy of the CGSA constitution is available to all graduate students from the CGSA officers.

Administrative Services

1. **Chemistry Office:** The Chemistry Office is located in room 138 of the Chemistry Building. Office hours extend from 8:00 am to 4:30 pm Monday - Friday. Students should not be in the office during non-office hours.
2. **Mailboxes:** Graduate student mailboxes are located in the Chemistry Office in room 138E. It is recommended that students check their mailboxes daily for important announcements.
3. **Office Supplies:** Office supplies are available to graduate teaching assistants for use in courses which they are teaching. These general supplies, such as class record books, paper, paper clips, and pencils, may be obtained from one of the staff members in the Chemistry Office.
4. **Announcements:** Announcements pertinent to the Chemistry Faculty and graduate students are e-mailed and/or posted in the Chemistry Department Office, room 138. These announcements concern upcoming seminars, meetings, career opportunities, etc.
5. **Paychecks:** Paychecks will be deposited in your checking account on the thirtieth day of each month or the last weekday preceding the thirtieth day. Inquiries about pay should be made to Ms. Susan Dewitt. Please do not contact the Payroll Office directly.
6. **Telephone Usage:** Telephones located in the research laboratories may be used by graduate personnel. If you need to make a long distance business call check with your research advisor.
7. **Keys:** Graduate students can obtain keys to the building and their teaching and research labs from Ms. Dewitt. Keys to instrumentation areas are provided based on research needs.
8. **Photocopies:** Graduate students can obtain photocopies for use in their instructional, research and seminar activities. Turn in materials to be copied to the Chemistry Office Staff.
9. **I.D. Cards:** Picture identification cards are prepared at registration time in the fall for each student. I.D. cards allow students several privileges, including use of the gym, use of library materials, check cashing privileges at the Campus Bookstore, and a 10% discount (for GTA's) on educational material in the Campus Bookstore.
10. **Desk Space:** Students are temporarily assigned office space in a general TA office in the Chemistry Building. Once a student has chosen a research advisor, desk space will be assigned to him/her in that laboratory. The University is not liable for personal losses from the building.
11. **Bus Service:** Bus service throughout the Louisville area is available through TARC (Transit Authority of River City). With a current UofL I.D. you can ride anytime, anywhere on TARC at no charge. Scheduling information can be obtained by calling 585-1234, visiting the Department of Public Safety (located in the Parking Structure on Floyd Street) or online at <http://www.ridetarc.org/>.
12. **Parking Stickers:** Graduate students may purchase "green" student stickers or "blue" faculty/staff stickers from the Department of Public Safety. The "blue" stickers are available to GTA's only.

13. Vending Machines: Vending Machines are located in the lower level of the Chemistry Building. If problems are encountered with their operation, contact Postal Services at 6699.

14. Bookstore: The campus bookstore is located on the ground floor of the Student Activities Center. General supplies and current textbooks are normally in stock. Graduate teaching assistants are entitled to a 10% discount on all educational material.

15. Emergency Numbers: Department of Public Safety 852-6111
 Health Services 852-6479
 Louisville Fire Department 587-3141
 Louisville Police Department 574-7111
 Emergency Medical Service 587-3911

16. Health Services: The University Health Service is located on Brook Street, between the Houchens Building and the Student Activity Center. Information may be obtained by calling 6479.

17. Housing: For information on university housing and apartments located close to campus, contact the University Housing Office at 6636.

18. Check Cashing: Personal checks may be cashed at the Bursar's Office, located in the Houchens Building. A valid student I.D. card is required.

19. Campus Post Office: The campus post office is located in the north end of the Houchens Building. Letters and packages may be mailed within the university if marked "Campus Mail". Stamps may be purchased in the bookstore, located in the Student Activities Center.

Requisitions/Orders

Items, such as chemicals or glassware, which are not available in the stock room (B-38) or main office are usually ordered by a requisition approved by the student's research director. Forms are provided in the main office for submission to Ms. Betsy Faulkner for ordering. These forms require information about the order (item name, catalog number, quantity, price), an account number and the research director's signature.

Library Services

Libraries on the Belknap Campus include the William F. Ekstrom (main) Library. In addition, the Kornhauser Health Sciences Library is located downtown on the Health Sciences Campus. Library hours vary and can be determined by calling 6758. Chemistry journals and books are located in the Ekstrom Library. The holdings can be searched by computer and books can be checked out with a student ID. Computerized searching of Chemical Abstracts is also available. Photocopy services are available for a small fee. Your research advisor may issue a copy card for copying research related articles. Library personnel can assist you in taking advantage of these services. Electronic databases and electronic journals are available to UofL personnel (<http://louisville.edu/library/research/>). There is an automated system that can be used to request copies of articles that are available online. Additional books and journals not available at U of L libraries may be obtained through interlibrary loan.

Computer Services

The University computing systems and networks are maintained by the office of Information Technology (<http://www.louisville.edu/it>) located in the Miller Information Technology Center. All graduate students are required to have e-mail accounts on the university system. These accounts will be activated the week before classes begin. The Department of Chemistry also maintains several workstations for computational chemistry. Since these computers are restricted to computational research or NMR calculations, keys to these rooms are issued to only a limited number of groups for after-hour use. Students must be trained and approved for these computers and only then may use the computer account assigned to their research group. The importing or loading of programs not approved by the system administrators will result in the loss of privileges for the individual and possibly for the research group.

Technical Services

The Chemistry Department maintains an electronics shop (Rm. B-36) and a modest machine shop (Rm. B-34). Rick Crume is in charge of these facilities. A machine shop is also maintained by the Physics Department in Rm. 101 of the Natural Science building.

Glass blowing services are available through Mr. Jeff Babbitt in the Chemistry Department at the University of Kentucky (606-257-7072) or locally through Mr. Butch Johnson at Custom Glassblowing of Louisville (239-2215).

Instrumentation

Chemistry graduate students have access to a wide range of instrumentation belonging to the Chemistry Department, other U of L departments, or individual research groups. Major pieces of instrumentation are listed online at <http://www.louisville.edu/a-s/chemistry/facil.htm>. Additional items such as inert atmosphere glove boxes, chromatographs, electrochemical instrumentation, etc. are found throughout the department in individual research labs.

Most departmental instrumentation is “hands on” and requires training and approval from Dr. Stolowich for NMR instruments and Dr. Maurer for the MALDI-TOF/MS. The exception is X-ray crystallography which is provided as a service to the department by Dr. John Richardson and Dr. Mark Mashuta. Students may be trained and approved for this equipment by taking Chem 688 and a subsequent independent study course (651 or 652). Use of instrumentation in other research groups or departments is with their permission only and must be arranged through your research advisor.

Dr. William Richmond is our Instrument Specialist and he must be informed of any problem with instructional instrumentation.

Timeline

Masters Degree

1st Semester	Begin coursework Attend seminars Interview at least 5 faculty Join a research group	2nd Semester	Finish coursework Start research Literature seminar (early)
3rd Semester	Literature seminar (deadline) Continue research Form thesis committee	4th Semester and beyond	Continue/Finish research Write and defend thesis

Ph.D.

1st Semester	Begin coursework Attend seminars Interview at least 5 faculty Join a research group	2nd Semester	Continue coursework Start research Attend seminars Literature seminar (early) Start cumulative exams
3rd Semester	Continue/Finish coursework Literature seminar (deadline) Continue research Continue cumulative exams Form dissertation committee	4th Semester	Finish coursework Attend seminars Continue research Continue cumulative exams
5th Semester	Continue research Finish cumulative exams Research proposal (early)	6th Semester	Continue research Research proposal (deadline)
7th Semester	Continue research Research seminar* (early)	8th Semester	Continue research Research seminar* (deadline)
9th Semester and beyond	Continue/Finish research Write and defend dissertation		

*MS degree awarded upon completion of research seminar.