Handbook

for

Chemistry Graduate Students

## Contents

**Introduction** 3

### Normal Progression to the PhD and MS Degrees

- Requirements for Degrees 4
- Diagnostic Exams 4
- Initial Advising 5
- Coursework and selection 5
- Courseloads 6
- Selection of Major Professor 7
- Initiation of Research 8
- First Year Evaluation 8
- Summer Registration 9
- Progression to PhD Candidacy 10
- Selection and Composition of the Graduate Committee 10
- Candidacy Proposal 11
- Original Research Proposal 13
- Publication Requirement 13
- Thesis and Dissertation 14
- Final Oral Examination and Defense 15

### Further Graduate Studies Notes

- Application 15
- GPA Maintenance 16
- Full Time Status 16
- Tutoring 16
- Outside Employment 17
- Transfer Credit 17
- Petitions 17

**Appendix 1** Information on Diagnostic Examinations at Entrance 19

**Appendix 2** Chemistry entry in the Graduate Catalog 2014-2014 23

**Appendix 3** Forms Used by graduate Students 29

**List of Important Websites for Graduate Students** 30
Introduction

The information in this booklet is offered to assist Chemistry graduate students in planning a clear path toward a graduate degree. It is not all inclusive and the concerned student also must consult more complete sources of information such as the Graduate Catalog, Graduate School publications, and the plethora of web sites now available at UT.

Another particularly important resource is the Graduate Assistant Handbook prepared by the graduate school. [http://catalog.utk.edu/index.php?catoid=15](http://catalog.utk.edu/index.php?catoid=15)

The first part of this guide attempts to present topics in the order in which a new graduate student typically needs the information. Some of the pertinent material from the Graduate Catalog is included for easy reference. The complete Graduate Catalog should also be consulted.

Several appendices accumulate more detailed information on topics important to earning a degree and examples of some Graduate School forms.

A companion publication, which is available through the Department of Chemistry website, provides additional information about the departmental personnel, facilities, and infrastructure.

We hope this is of use and welcome comments for improvement.
Normal Progression to the PhD and MS Degrees

Requirements for Degrees

The requirements for the PhD and MS degrees in chemistry are summarized in the box shown below, which is adapted from text that will be listed in the Graduate Catalog as of Fall 2014.

<table>
<thead>
<tr>
<th>Graduate Catalog</th>
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<tbody>
<tr>
<td><strong>PhD:</strong></td>
</tr>
<tr>
<td>• Research and a dissertation to give at least 24 hours of graduate credit in Chemistry 600. Registration must be continuous from the beginning of research.</td>
</tr>
<tr>
<td>• Participation in seminar (CHEM 501) at the beginning of the period of graduate study until 6 hours of satisfactory credit has been obtained.</td>
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<tr>
<td>• Prescribed courses based on performance on diagnostic examinations.</td>
</tr>
<tr>
<td>• Completion of the two-course sequence Chemistry 603-604.</td>
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<tr>
<td>• 18 additional hours in courses at the 500 level or above including at least one course numbered 610 or higher and one of the following sequences – 510-511-512-513; 530-531-532-533; 550-551-552-553; 570-571-572-573; and 590-594-595.</td>
</tr>
<tr>
<td>• Publication of a minimum of one article in a peer-reviewed journal describing research performed during graduate studies.</td>
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<tr>
<td>• A final oral examination.</td>
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<tr>
<td><strong>MS:</strong></td>
</tr>
<tr>
<td>• Research and a thesis to give 6 to 12 hours of graduate credit in Chemistry 500.</td>
</tr>
<tr>
<td>• Participation in seminar (CHEM 501) at the beginning of the period of graduate study until 3 hours of satisfactory credit has been obtained. (No more than 3 hours may be applied to the course requirements.)</td>
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<tr>
<td>• Prescribed courses based on performance on diagnostic examinations.</td>
</tr>
<tr>
<td>• Sufficient graduate coursework in chemistry (at the 400 level or above) and/or a related field to make an overall total of 30 hours, including one of the following sequences – three of 510-511-512-513; three of 530-531-532-533, 550-551-552, 570-572-573 and 590-594-595. At least 14 hours of this graduate course work must be at the 500 level or above.</td>
</tr>
<tr>
<td>• A final oral examination.</td>
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The remainder of this section of the Handbook discusses some aspects of these requirements in more detail. You can always consult the department’s graduate program director if you have questions about these requirements.

Diagnostic Exams and Qualifying Courses

While advanced degrees largely involve developing specialized training in an area, students with an MS or PhD in Chemistry are also expected to have a broad general knowledge of the discipline. The diagnostic exams, sometimes referred to as entrance exams because they are administered when new graduate students arrive, and the qualifying courses that students take if they do not pass the diagnostic exams, serve the purpose of establishing that all students who receive an MS or PhD in Chemistry from the University of Tennessee have that broad general knowledge of chemistry. The diagnostic exams are discussed fully in Appendix 1. Each exam is graded as a pass (exempt), a marginal fail (some strength in the area is shown), or fail.
Students are required to qualify in 3 of these 4 areas: Analytical, Inorganic, Organic and Physical Chemistry. A student qualifies in an area by either passing the diagnostic exam or by satisfactorily completing a designated course. The purpose of the exams is not to limit admission or progress but to inform the advisor and the student of minor to serious deficiencies in a student’s preparation for graduate courses. If the deficiencies are minor (marginal fail on the exam), the indicated qualifying courses will include a graduate course in that area. Some additional effort may be required to complete the particular graduate course as the exam results indicate the student has some gaps in either comprehension or mechanics in material fundamental to that field. When the deficiency is more serious, especially if this occurs in more than one area, students must remediate the deficiency with an undergraduate course before proceeding to graduate courses in the deficient area.

NOTE: Only certain courses are designated as qualifying courses for an area! These are:

Analytical: 310, 510, 511, 512, 513
Inorganic: 430, 530, 531
Organic: 350, 360, 450, 550, 551
Physical: 473, 483, 570, 572, 573

The letter that a student receives notifying them of their diagnostic exam results will clearly indicate the courses recommended for them to qualify in an area based on their exam results.

Deficiencies discovered by these exams should be made up in the first year of graduate study, if possible. When this is not possible, as doing so will adversely impact progression in required courses in the student’s major area, the remedial process should be completed as soon as possible in the second year. Deferring completion of the qualifying process till the second year should not be taken lightly and requires approval of the student’s advisor.

Initial Advising

Following completion of the diagnostic exams, students meet with temporary advisors to discuss initial course selection. Typically a course in the student’s intended major along with one other course will be recommended. A strong performance on the entrance exams (passing at least 3 exams) can allow a focused student to concentrate immediately on their area of specialization by taking two courses in that area in the first semester. It is important to choose the initial courses wisely to prevent an overload and to insure that courses in the intended major can be completed as quickly as possible to allow the student to begin her or his research and to allow PhD students to begin to prepare for admission to candidacy.

Coursework and Selection

Each Chemistry sub-discipline offers three or four courses that explore the fundamental concepts of the field. All PhD students must complete one of these sequences. In addition, it is recommended that the minimum course requirements for the PhD (18 hrs) be completed with courses that complement the main sequence. A minimum of six 3-credit hour courses must be completed with a GPA 3.0 or greater for the PhD degree. MS students are required to complete 3 courses of one of the sequences as part of their 30 total required hours. Students involved in
interdisciplinary research projects or with significant deficiencies as revealed by the diagnostic exams may need to take more than the minimum number of courses. Course selection following the initial semester must be done in consultation with a student’s major professor, who can give advice on courses taught in other departments that might bear heavily on a particular research area.

One point about coursework is worth clarifying. For both the MS degree and the PhD degree, completion of prescribed courses based on performance on the diagnostic exams (discussed previously) is required. In an area in which a student receives a marginal failing grade on the diagnostic exam, and is therefore eligible to qualify by completing a graduate-level course, the graduate-level course can be used to meet the coursework requirements for the degree.

Note: Some University rules for graduate coursework probably differ from what you are used to from your undergraduate experience. Here are a few important points:

1. You must maintain at least a 3.0 GPA on all graduate coursework to be in good academic standing with the graduate school. You cannot receive an advanced degree if you have less than a 3.0 GPA!
2. No graduate course with less than a “C” grade (a “D” or “F”) can be used to satisfy a degree requirement.
3. A graduate course cannot be repeated to raise a course grade. (In effect this means you get one attempt and one attempt only at taking a course for a grade).
4. A 400-level course may be taken for either graduate or undergraduate credit. 400-level courses taken for graduate credit can affect your graduate GPA (for good or bad). 400-level courses taken for graduate credit may be used to help meet course requirements for the MS degree only. 400-level courses designated as qualifying courses may be taken for either graduate credit or undergraduate credit; satisfactory completion either way meets the qualifying requirement in that area. The normal default status for enrollment in a 400-level course by a graduate student is for graduate credit. The deadline for changing is the “change credit/grading” deadline given in the timetable/financial deadline calendar posted on the Registrar’s web site (http://registrar.utk.edu/).

Courseloads

Most first year students begin by taking two 3 hour courses and Chem 501 (seminar) for a total of 7 credit hours in each semester of their first year. Both courses taken in the semester are most often graduate courses (500 level or above), but some students may end up taking a 300 or 400 level qualifying course instead based on their performance on the diagnostic exams. Students on a ½ time assistantship taking 6 or more hours per semester (fall and spring) are considered to be full time. At this pace, coursework requirements for the PhD can normally be completed within 3 or 4 semesters. Some students who are especially well prepared or have lighter assistantship responsibilities choose to take 3 courses per semester. Students who do this successfully will of course complete their coursework requirements more rapidly and be able to become completely engaged in research earlier in their graduate career.

Advanced degrees in Chemistry are principally research degrees, that is, your principal
challenged is to become a good scientist thoroughly knowledgeable in the topics that bear on the completion of your dissertation project. Given the enormous body of scientific knowledge it is impossible to provide sufficient courses to satisfy every need of active researchers. What can be done is provide courses in the fundamentals of each of the traditional Chemistry sub-disciplines so that beginning researchers are equipped with knowledge of the principles required to assimilate facts and results on their own. In other words, graduate courses provide an intellectual workbench and a key to the library in which that foundation is most fruitfully employed.

The development of new tools and the improvement of old methods and approaches are so dramatic that courses cannot possibly replace professional vigilance of current developments. Active researchers must maintain a connection to the primary literature in their areas of interest including related disciplines. Nevertheless, some expertise is required to facilitate this activity; hence, basic courses are required.

**Selection of a Major Professor**

Selection of a research advisor, or major professor, is undertaken during the first semester of graduate study. Approximately 2 weeks after the beginning the fall semester, the department head meets with all incoming students to discuss the selection process. At that time, a booklet with descriptions of the research projects is given to each student along with a sheet that is used to document student interviews of faculty and the student’s selection of an advisor. The booklet is only one resource for learning about the research of the faculty; web-pages, publications, and the personal interview are other important resources. Each student is required to complete interviews with a minimum of seven Chemistry professors by the end of November.

Selection of a research advisor is one of the most important steps in making rapid progress through the graduate degree (MS or PhD) program. Any number of questions can be posed while making this selection, such as: Does the research excite you? Is the research group one in which you feel comfortable? Are the members of the group hard working and dedicated?

When all selections are returned from the incoming class, the Department head will contact the individual faculty members and determine if their selection as major professor is acceptable in each case. Assuming the response is affirmative, which it typically is, the process is complete and the student will be so notified by either the major professor or the Department head.
Each student is asked to provide first and second choices for major professor. Normally, students get their first choice. Occasionally, a particular research group attracts too many new students to accommodate them all due to lack of space, funds, etc. When this occurs, a student may be asked to consider her or his second choice. There is no stigma associated with this. In fact, it is often the case that the specification of first and second choice is arbitrary especially when a student has broad or multidisciplinary interests.

Once the major professor selection is complete, students should move their offices (if necessary) to the research area of the major professor and notify the main office and the general chemistry office of any change in room number or phone number. This should be accomplished by the start of Spring semester.

**Initiation of Research**

Beginning no later than the start of Spring semester (or the second semester in residence) students should begin to work on their research project as directed by the research advisor. The nature and extent of research activity will vary widely depending on the nature of the project but it is essential that the effort begins. Since most first year graduate students will be taking two classes and teaching as a full GTA, it is important to develop time-management skills so multiple goals can be pursued successfully.

All graduate students should begin registering for research during their second semester in residence. It is appropriate for full time GTAs to register for 1 credit hour of Chemistry 500 at the very least. (Those supported with research funds should register for more than the minimum.) Note that if a student has entered the PhD program directly, registration for 500 may be blocked by the computer. If this happens, see the Associate Head who will sign an add slip to override the block. Once a student registers for Chem 600 she or he must register for 600 every semester until graduation! Any lapse in registration for Chem 600 requires permission for a leave of absence from the graduate studies office and approval of the Dean of the Graduate School.

It is the recommendation of the department that PhD students make the transition from registering for thesis research (Chem 500) to dissertation research (Chem 600) after they are admitted to PhD candidacy.

**First Year Evaluation**

Each year following the end of Spring semester, the Chemistry faculty meet to evaluate the performance of first year graduate students. Students who enter the department in January are evaluated after three semesters in residence. This is discussed more completely in the material on diagnostic exams found in Appendix 1.

In the first year evaluation, students are reviewed based on academic performance, completion of diagnostic exams and qualifying courses, and preliminary progress on research. The expectation of our graduate students is that they will have:
• maintained at least a 3.0 grade point average
• made significant progress by completing 12 “coursework” credit hours that count towards the requirements for a graduate chemistry degree
• joined a research laboratory and made initial progress on a research project

After considering each student based on these criteria, students are placed in one of 4 categories with the following definitions.

Category 1: Your performance to date has been satisfactory; you have completed the entrance exam requirements and maintained good academic standing. Therefore you are on track at this point for continuation in the PhD program.

Category 2: Your performance to date is satisfactory with the noted exceptions: typically these include failing to complete the entrance exam requirements in the first year or minor variance from a 3.0 overall GPA. Students who are in category 2 may move to category 1 by rectifying the noted exception within a designated timeframe. Students in category 2 will normally be reevaluated at the end of the second year.

Category 3: Your performance to date indicates you should go directly to the MS Degree.

Category 4: Your performance to date has been unsatisfactory. You are dismissed from the program. Please note that dismissal may occur regardless of a student’s status with the Graduate School.

The results of first year evaluation may be appealed through the general appeals process for departmental requirements indicated in this handbook (see page 13).

Summer Registration

Graduate school policy requires that all students who are using facilities and faculty time are required to be registered, even in the summer semester. If you were on a ¼ or ½ time teaching assistantship in the spring semester, you continue to have a tuition (i.e., fee) waiver for the summer; the only registration costs are the additional fees not covered by the tuition waiver. All graduate students in chemistry are expected to be actively working on research during the summer and should register for 3 hours of either Chem 500 (MS students and PhD students who have not yet been admitted to candidacy) or 600 (students who have been admitted to PhD candidacy). Registration for 3 hours entitles one to continued health coverage through the summer and use of the university health center as the primary care provider.

Note Well!

An important aspect of summer registration involves the health insurance provided to graduate students employed by UT. According to the Graduate Assistant Handbook, registration for a minimum of 3 credit hours is required for continuation of health insurance coverage in the summer!
Progression to PhD Candidacy

Effective for Students entering UTK in August 2010 or later

A student in the Chemistry Department becomes a candidate for the PhD in Chemistry after she or he submits a written proposal describing her or his PhD research project, presents the proposal orally to her or his PhD Candidacy Committee (PCC), and answers questions about the proposal to the satisfaction of the PCC. The presentation of the written proposal and its defense before the PCC constitutes the department's candidacy examination. The candidacy examination evaluates the student's preparation to undertake research, the student's progress to date, and the student's general background knowledge in appropriate fields.

The deadline dates listed in the subsections below are for students who enter the Chemistry graduate program in the Fall semester. Consult subsection 5 if you entered the graduate program in another semester, or if you change research groups during your first year of study.

I. Formation of the Ph.D. Candidacy Committee

In consultation with her or his research advisor(s), a student should make a list of potential PCC members early in the Fall semester of her or his second year of graduate school. Ordinarily a student's PCC will become her or his Ph.D. committee once a student becomes a Ph.D. candidate, and so the composition of the PCC must generally satisfy the rules for Ph.D. committees that have been established by the University's Graduate School as briefly discussed below.

The committee will consist of four faculty members, one of whom will be the research advisor. The additional faculty members from the Chemistry department must include one professor from the student's division and one member from another division. A committee member from outside the department must also be selected. The PCC must consist of faculty members at the rank of assistant professor or above. Three of these faculty members, including the Chair, must have been approved by the University's Graduate Council to direct doctoral research. (Ordinarily the Chair of the PCC is a student's research advisor, in those cases where a student's research advisor has been approved by Graduate Council to direct doctoral research.)

All members of the committee must be chosen so that their area(s) of expertise have some relevance to the student's proposed course of study to allow adequate evaluation during the candidacy exam. After a suitable list of members is constructed, the research advisor(s) will determine the final composition of the PCC. At this point, the student or their research advisor should approach potential PCC members and ask if these individuals are willing to serve on the student's PCC. Once the student and her or his research advisor have drawn up a list of potential PCC members, the research advisor will discuss the composition of the

Graduate Catalog

**PhD:**
- Research and a dissertation to give at least 24 hours of graduate credit in Chemistry 600. Registration must be continuous from the beginning of research.

**MS:**
- Research and a thesis to give 6 to 12 hours of graduate credit in Chemistry 500.
student's PCC with the faculty in the departmental division in which the student intends to study. After the PCC composition has been endorsed by a majority vote of the faculty members of that division, the student will submit to the departmental office a Doctoral Committee Appointment form with the signatures of all PCC members. This form must be submitted by the date on which a student's candidacy proposal is due (typically December 20) so that final approval of the PCC composition can be obtained from the department head before examinations begin.

II. Candidacy Exam (November – April of Second Year)
The non-coursework related portion of the candidacy requirement will be met by writing and orally defending a proposal based on the research that the student is performing. The proposal and examination should also cover general knowledge, i.e. this exercise will have both a focused research and a breadth component. This exam will be conducted in the student's second year of study. The research proposal will be read and graded by a committee that will also administer the candidacy exam.

A. Format of the Candidacy Proposal (CP)
A student's candidacy proposal (CP) is a written proposal based on the student's current and proposed Ph.D. research. The CP should typically be 8 to 12 pages long and should follow the format of a major funding agency in the discipline of study chosen by the student. The format of the proposal for all students will be decided by each division. The CP should include sufficient background information to situate the student's research program in a broader context, a summary of work accomplished to date, and a prospectus of work to be completed for the Ph.D. degree.

Approximately, 1-2 pages of the proposal should be devoted to research progress. If the student has not made adequate research progress by the submission deadline for the Research Proposal, they will be allowed to supplement their proposal with a 1-2 page addendum outlining research progress one week before their oral examination.

After receiving a student's CP, the PCC will review it to insure (1) that the CP includes sufficient background material and literature citations to situate the student's research in a broader context and (2) that the student demonstrates an adequate base of general knowledge in her or his field.

At the discretion of the PCC, the student may be given a list of journal articles and other materials to read and master, and/or a list of topics that the student is expected to master; these exercises are intended to help students develop a broad background in their chosen field commensurate with that expected for a Ph.D. candidate. For students who construct an exceptional proposal that adequately covers the background for their project and demonstrates a general understanding of the discipline, the assignment of further materials may be waived. At the discretion of the committee, this set of papers can also be accompanied or replaced by a set of general papers and/or a list of required topics upon which the student will also be evaluated during the oral examination. This exercise is intended not only to evaluate the student's ability to understand the literature and to place their work in context with that of others but also to gauge their general knowledge.
The written portion of the exercise must be submitted by December 20\textsuperscript{th}, and the committee will provide a list of reading material and background topics no later than January 10\textsuperscript{th}.

**B. Format of Oral Examination**
A student will make an oral presentation of her or his CP to the PCC in the spring semester of her or his second year of graduate study. The PCC will then ask the student questions about her or his CP and the additional reading material assigned to the student by the PCC. The CP defense is intended to evaluate the student's abilities to (1) understand relevant literature, (2) place her or his work in a broader context, and (3) demonstrate a base of general knowledge in appropriate fields. The CP defense will typically last no more than 2 hours, with about 30 minutes devoted to presentation of the CP and 1 to 1.5 hours devoted to questions and discussion.

The oral portion of the candidacy examination must be administered no later than April 1\textsuperscript{st}.

**C. Alternate Time Lines for Examination**
There are two situations in which the examination time line will need adjustment. Students who enter the Ph.D. program in Spring, and are off sequence, will be grouped with the class entering in the following Fall. In other words, these students will submit the proposal in their fourth semester in residence. Students who change groups in the first year of study before completing the candidacy exam will be given a three month extension on all deadlines. Students who change groups at a later date will be evaluated by the division on a case-by-case basis.

**D. Possible Outcomes**

1. Three outcomes are possible for the initial CP defense

   (a) Pass: A unanimous vote of “pass” from the PCC is required for the student to pass the CP on the initial defense.

   (b) Fail: If a student receives a unanimous vote of “fail” from the PCC, then the student will be directed to the M.S. program.

   (c) Requires Further Development. On the initial defense only, a grade of “Requires Further Development” may be assigned to allow for remediation of any deficiencies. This outcome can be assigned at the discretion of the committee or due to a non-unanimous vote concerning the outcome of the first exam. Remediation resulting from this outcome is also at the discretion of the committee, and may include revision of the CP written document, one additional attempt at oral defense of the CP, or both a revision of the CP written document and one additional CP oral defense. The PCC may also provide the student with a list of journal articles and other materials to read and master, and/or a list of topics that the student should review and master.

2. If a second attempt at the CP is allowed through the “Requires Further Development” mechanism of section D1, then the potential outcomes for the follow-up exam are listed below. Only one second attempt at the CP is allowed.
(a) Pass: A minimum of 3 votes of “pass” from the PCC, as well as concurrence from the committee chair, is needed to pass a second attempt at the CP.

(b) Fail: If the student does not receive the minimum of 3 “pass” votes from the PCC with concurrence from the chair on the second CP attempt, then the student will be directed to the M.S. program.

The final decision on each student’s defense must be made, and any remediation must be completed, no later than July 1 of their second year to determine if they will gain entrance to the Ph.D. program.

E. Receiving Credit for the Examination - Chemistry 603 (Candidacy Proposal, 2 hours)
During the semester in which they undertake the candidacy examination, students are required to sign up for a two hour course, Chemistry 603, to receive credit for this exercise. Successful completion of Chemistry 603 fulfills the requirements for Ph.D. candidacy.

III. Chemistry 604 (Original Research Proposal, 1 hour)
An original research proposal (ORP) will be generated and defended. Passing the ORP examination is a graduation requirement that must be completed at least six months prior to the dissertation defense, and this will typically be done in the student’s third or fourth year. During the semester in which they undertake the ORP, students will be required to register for a 1 credit hour course, Chemistry 604. The proposal and examination format for the ORP is analogous to that of the CP, except that the topic is not the dissertation research. The ORP committee should consist of the same members as for the candidacy exam. To pass the ORP exam, a unanimous vote of “pass” from the PCC is required. In addition, to receive credit for 604, students must submit a current curriculum vitae to the PCC, and must have given a public presentation of their dissertation research at a poster or oral session at either a meeting or within the department at some point in their graduate career.

Processes for Appeals of Graduate Requirements

The general appeal process for graduate requirements described in this handbook follows the traditional three-level structure of the University (Department, College and Graduate School). An appeal should first be made at the departmental level by submitting a written petition detailing the reasoning for the appeal to the Chemistry Department’s graduate advisory committee. Please note that the Graduate School requires that petitions be submitted to the department within 30 days of the incident that is the focus of the appeal. The graduate advisory committee will review the appeal and may consult with the petitioning student’s research advisor and/or degree committee, after which the graduate advisory committee will provide a written recommendation to the full faculty. The full faculty will then vote on the appeal. Subsequently, written petitions may be considered at the College level by the Dean’s office, and at the University level by the Graduate School.

Publication Requirement

The publication of research results in the literature is an important milestone for developing scientists and a critical component for the success of graduate students in their future careers.
For this reason, our students are encouraged to maximize the publication of high quality research during their graduate careers. To emphasize the importance of these efforts, the department requires the publication of a minimum of one article in a peer-reviewed journal describing research performed during graduate studies prior to graduation with a Ph.D. in Chemistry. A copy of the qualifying publication must be presented to the doctoral committee along with the final dissertation in order to receive final signatures from faculty members indicating completion of the dissertation requirement. If an accepted publication is not yet in print, a copy of the submitted manuscript along with proof of acceptance from journal editorial staff will fulfill this requirement.

Graduate Catalog – Master’s Thesis

Thesis Registration
A student must be registered for course 500 each semester during work on the thesis, including a minimum of three hours the semester in which the thesis is accepted by Graduate Student Services. Six hours of 500 are required for the thesis option. After receiving the master's degree, a student is no longer permitted to register for Thesis 500.

Thesis
The thesis represents the culmination of an original research project completed by the student. It must be prepared according to the most recent Guide to the Preparation of Theses and Dissertations, available at http://web.utk.edu/~thesis. Paper or electronic submission will be approved by the student’s committee prior to final preparation of the thesis. Two paper copies or an electronic copy of the thesis must be accompanied by two approval sheets, signed by the members of the master's committee. The approval sheets reflect the final format for submission. The approval sheets certify that the committee members have examined the final copy of the thesis and have found that its form and content are satisfactory.

Final Examination for Thesis
A candidate presenting a thesis... must pass a final comprehensive oral examination on all work offered for the degree..... The final draft of the thesis must be distributed to all committee members at least two weeks prior to the date of the final examination...... This examination must be held at least two weeks before the final date for acceptance and approval of thesis by the Office of Graduate Student Services on behalf of the Graduate Council. The major professor must submit the results of the defense by the thesis deadline. In case of failure, the candidate may not apply for reexamination until the following semester. The result of the second examination is final.

Thesis and Dissertation

MS students prepare a thesis; PhD students prepare a dissertation. Excerpts of the graduate catalog descriptions regarding master’s thesis and PhD dissertation are included below. The following discussion is directed to the PhD.

Following the completion of Chem 604, assuming all other required class work has been completed, the PhD candidate has only to focus on completion of the dissertation project, write and defend the dissertation. Under normal circumstances this should be completed in about an additional 1.5-2 years. Note that when Graduate Teaching Assistantships are initially offered
they are guaranteed for the “normal duration” of PhD study which is indicated as 5 years or less. Thus, extension of the GTA appointment for a longer period requires justification on a semester-by-semester basis.

A major stumbling block for many students is the actual preparation of the dissertation. Generally, it is not advisable to wait until the research is complete to begin thinking about the content and format of the document. Production is much swifter if planning begins well in advance and electronic records of experimental procedures, data summaries, spectra, etc. are accumulated as they are produced. All dissertations require a summary of prior investigations recorded in the primary literature and this can also be accumulated and summarized well in advance of the project completion.

The final format (and, of course, scientific content) of the dissertation becomes clearer as the project approaches completion. By this stage, however, much of the dissertation content has been accumulated and large portions of the final document can be ready for inclusion as “cut and paste” material. Conscientious record keeping, including experiment summaries, etc. makes production of the final document a less awesome task. (Note that the Graduate School has a set of guidelines for the final form of the MS thesis and PhD dissertation. Before a student begins to write her or his thesis or dissertation, she or he should contact the Graduate School’s thesis and dissertation consultant to learn about these guidelines.)

**Final Oral Examination and Defense**

The oral examination is conducted by the student’s full dissertation committee. Generally it involves a public presentation of the project including a brief historical perspective, a clear statement of the problem or objective, a description of the approach to the solution or completion, and a summary of the principal experimental results and conclusions. This is followed by an open question period.

Following the public presentation, the examination is closed and the candidate is questioned by the committee. When the committee feels they are suitably informed, they confer privately and reach a final decision concerning the acceptability of the dissertation. This is quickly transmitted to the candidate along with any suggestions they have for improving the dissertation. In the case of a negative decision, they will inform the candidate of any options. The committee, while convened, will complete and all sign the “Report of Final Examination/Defense of Thesis or Dissertation”.

Following a successful defense, the dissertation is adjusted according to any final instructions from the committee and formatted to bring it into compliance with Graduate School requirements. When the dissertation is complete to the wishes of the committee they each sign the acceptance page which is part of the dissertation. (This can occur at the final examination if they are comfortable that typos and other cosmetic changes can be made acceptably before final transmission to the Graduate School.) Transmission of the final copy to the Graduate School constitutes the last step prior to official degree conferral.
Further Graduate Studies Notes

Application!

Obviously, the first step with the Graduate School is submission of an application to be admitted to the University as a graduate student. When you filled out that application, you had to select whether you were entering the MS or PhD program. We encourage prepared students to work toward the PhD degree. The choice you made can easily be changed; it also affects what research classes you are allowed to register for, specifically Chem 500 and Chem 600. Chem 500 is strictly speaking, thesis (MS) research and Chem 600 is dissertation (PhD) research.

If you were admitted into the Master of Science program, you will be permitted to register for Chem 500 at the appropriate time, the actual start of your research in a particular research group. However, if your intention is actually to complete the PhD, you will have to file a “Request for Change of Graduate Program” prior to entering candidacy for the PhD. This should be done when you and your major professor decide that you should begin registering for Chem 600. (Note the continuous registration requirement for Chem 600.)

If you were admitted directly to the Doctoral program, you may be prevented from registering for Chem 500. If this happens, simply request an add slip from the main office each semester until such time as you and your major professor decide that you should begin registering for Chem 600. (Note the continuous registration requirement for Chem 600.)

GPA Maintenance

The Graduate School requires that all graduate students maintain a “coursework” GPA of 3.0 or above. It is the policy of the Graduate School that, upon completion of 9 hours of graduate coursework, a graduate student will be placed on academic probation when his/her GPA falls below 3.0. Continued graduate study will be permitted if each semester’s GPA is 3.0 or greater. When the cumulative GPA reaches 3.0 the student will be removed from probationary status. No degree can be awarded unless the cumulative GPA is 3.0 or greater. While the prior information pertains to the policy of the Graduate School for academic dismissal and probation, the Department of Chemistry is permitted to set higher standards. Specifically, students may be dismissed without a prior period of academic probation after the first two semesters if their GPA falls below a 3.0. This review is discussed in more detail in the section on “First Year Evaluation” on page 8.

Full Time Status

For many purposes a graduate student must maintain full time status. Most Chemistry graduate students are employed 50% time as either teaching assistants, research assistants, or a combination of the two. For 50 % employed graduate students, full time status is attained by registration for a minimum of 6 credit hours in both the Fall and spring semesters and 3 credit hours in Summer semester.

Certain benefits are available only for students registered for a minimum number of credit hours. Sometimes that is whatever constitutes full time status. However, some require a minimum of 9
hours, for example free use of the health clinic in fall and spring semesters. Sometimes these benefits are available if a student agrees to pay the various fees associated with 9 hour enrollment. Thus, a Chemistry graduate student may wish to register for 6 hours but pay fees for 9 hours.

**Tutoring**

Graduate students are allowed to tutor students in our undergraduate courses at the Department-set rate provided the student is not in the tutor’s class and there is no way the tutor can influence the student’s grades. A list of Department tutors is kept in the General Chemistry Office, where graduate students should go to be added or removed from the list.

Occasionally Chemistry graduate students are offered positions as tutors in other programs on campus such as the Black Cultural Center or the Athletic Department. A few hours of such activity are acceptable but it should never interfere with Department responsibilities including research progress.

**Outside Employment**

Graduate students in Chemistry typically hold 50% time appointments as teaching or research assistants and they are expected to pursue coursework or research activity the remainder of their time. Outside employment, except for a few hours of tutoring, or other professional activity is prohibited.

**Transfer Credit**

Formally the University does not transfer graduate credit obtained at other Universities. For students with significant prior graduate credit in courses equivalent to those offered in our department, modifications (i.e., reductions) in course requirements may be possible and requires approval of the Dean of the Graduate School. The graduate program director for the department can evaluate a student’s prior graduate coursework and determine whether the department is willing to recommend a modification to the degree requirements to the graduate school. Students who believe they have sufficient prior graduate credit to warrant such consideration should be prepared to provide transcripts and syllabi as evidence of course content and performance. Coursework reductions are generally limited to one or two courses; coursework taken outside the US is typically not accepted as a basis for coursework reduction due to the extreme difficulty in establishing equivalence to courses here at UT.

**Petitions**
Exceptions or substitutional modifications to departmental requirements normally require prior approval by vote of the faculty. Proposals must be submitted in writing to the head or associate head in the form of a petition. Matters that are sometimes considered are: substitution of an appropriate course for a required course for the degree, extension of departmental support beyond the designated maximum, and extensions of designated limits for completion of a requirement. Exceptions must be based on a demonstrated equivalence for the substitution proposed or, if an extension for completion of a requirement is requested, it should be demonstrated that failure to meet the requirement was the result of extraordinary circumstances beyond the control of the student (medical, etc). Students should consult with their major professor regarding preparation of their petition.
Appendix 1

Information on Diagnostic Examinations at Entrance

For Graduate Students in Chemistry

Department of Chemistry
The University of Tennessee
Knoxville, Tennessee 37996-1600

May 21, 2005

All entering fully-admitted full-time graduate students are required to take four diagnostic examinations: analytical, inorganic, organic, and physical chemistry. Each examination will cover the generally-accepted undergraduate content of the area as usually given in a one-year course taught beyond the elementary chemistry level. The examinations will be given preceding the beginning of classes of the Fall Semester. The exact times will be announced during the previous summer.

Each entering student must demonstrate proficiency in three areas, either by passing the diagnostic examination or by satisfactory completion of a qualifying course as designated by the faculty diagnostic examination committee. The qualifying courses from which the committee will make their designations are: analytical (310, 510, 511, 512, 513), inorganic (430, 530, 531), organic (350, 360, 450, 550), physical (473, 483, 570, 572, 573). All designated courses should be taken in the first year of graduate study. It is emphasized in the strongest possible terms that adequate review and preparation for these examinations will have an important bearing on the students' progress, since proficiency in one or more of these courses is a large step forward. The examination system is designed to accomplish the following:

1.) It allows us to certify that a student is competent in the subject matter normally offered at the undergraduate level in the fields of analytical, inorganic, organic, and physical chemistry, and

2.) It offers the able and well-motivated student who is deficient in preparation in one or more of the above fields the opportunity to remedy this deficiency without serious delay in his/her graduate study.

In general, these proficiency examinations have been prepared and evaluated by national groups with the results standardized against a significant number of students at the beginning graduate level at other universities. The exams often used are the Graduate Placement Examinations prepared by the American Chemical Society, Division of Chemical Education.

It is strongly recommended that entering students prepare for these examinations from almost any 'standard' undergraduate textbook in the respective areas.

The beginning graduate student should be aware of another evaluation process which occurs at the end of the first year of graduate study. The staff collects for all the students information about diagnostic examination scores and grades on all courses taken during the first year and recommends classification of each student into one of the four categories as indicated below:

1.) Category 1 the student proceeds directly to the PhD. To be eligible for this category, a student must have made satisfactory scores on the diagnostic examinations or have performed
adequately in qualifying courses. Also, at least six hours of other graduate course work in addition to seminar must have been complete with a grade point average of at least 3.0.

2.) Category 2 is for the student who has fallen just short of the performance needed for Category 1. The faculty will normally prescribe a program which, if completed successfully, will result in reassignment to Category 1. If the program is not successfully completed, the student will be reassigned to Category 3.

3.) In Category 3 the student is directed into the MS degree program with the possibility for reconsideration for the PhD program near or after completion of the MS degree requirements with good performance. This category is normally assigned to students who have fallen somewhat below the performances indicated in 1 or 2 above, in diagnostic examinations or courses, but who still show promise of reaching an overall grade point average of 3.0 which is required by the University prior to the award of any graduate degree.

4.) Placement in Category 4 constitutes a faculty recommendation that a student terminate his/her graduate study in chemistry at this University.

It should be emphasized that in the above evaluation process, the record of each is examined by the entire faculty and individual decisions are made within the guidelines indicated above, but it is understood that the staff will use its discretion and all information available in assigning a category to any particular student.

This system is of great value to the student and to the faculty in that it strongly encourages the well-prepared student but at the same time does not severely penalize the strongly motivated but somewhat less well-prepared beginning graduate student.
Appendix 2

Chemistry entry in the Graduate Catalog 2014-15

DEPARTMENT OF CHEMISTRY
http://www.chem.utk.edu
Charles S. Feigerle, Department Head
Frank Vogt, Associate Department Head
Michael D. Best, Director of Graduate Studies

Professors
Baker, D.C., (Ziegler Professor), PhD - Ohio State
Barnes, C.E., PhD - Stanford
Bartmess, J.E., PhD - Northwestern
Bursten, B.E. (Distinguished Professor), PhD - Wisconsin
Compton, R.N. (Ziegler Professor), PhD - Tennessee
Dadmun, M.D. (Ziegler Professor, Joint Faculty), PhD - Massachusetts
Dai, S. (Joint Faculty), PhD - Tennessee
Feigerle, C.S., PhD - Colorado
Guiochon, G.A. (Distinguished Scientist, Science Alliance Center of Excellence), PhD - Paris (France)
Hinde, R.J. (Associate Dean), PhD - Chicago
Kabalka G.W. (Robert H. Cole Professor, Alumni Distinguished Service Professor), PhD - Purdue
Kovac, J.D., PhD - Yale
Kilbey II, S.M., PhD - Minnesota
Larese, J.Z., PhD - Wesleyan
Mays, J.W. (Distinguished Scientist, Science Alliance Center of Excellence), PhD - Akron
Musfeldt, J.L. (Ziegler Professor), PhD - Florida
Schweitzer, G.K. (Alumni Distinguished Service Professor), PhD - Illinois
Sepaniak, M.J. (Ziegler Professor), PhD - Iowa State
Sokolov, A.P. (Governor’s Chair, Science Alliance Center for Excellence), PhD - Novosibirsk (Russia)
Williams, T.F. (Alumni Distinguished Service Professor), PhD - London (UK)
Xue, Z. (Ziegler Professor), PhD - California (Los Angeles)
Zhao, B. (Ziegler Professor), PhD - Akron

Associate Professors
Best, M.D., (Ziegler Professor), PhD - Texas
Campagna, S.R. (Atlantic Richfield Professor), PhD - Princeton
Jenkins, D.M., (Mamantov Professor) PhD - California Institute of Technology
Vogt, F., PhD - Karlsruhe (Germany)

Assistant Professors
Calhoun, T.R., PhD- Berkeley
Darko, A.K., PhD – Florida
Long, B.L., PhD - Texas
Roy, S., PhD - Yale

MAJOR
Chemistry
Analytical Chemistry concentration
Environmental Chemistry concentration
Inorganic Chemistry concentration
Organic Chemistry concentration
Physical Chemistry concentration
Polymer Chemistry concentration

DEGREES
MS

Chemistry
Analytical Chemistry concentration
Chemical physics concentration (with Physics Department)
Environmental Chemistry concentration
Inorganic Chemistry concentration
Organic Chemistry concentration
Physical Chemistry concentration
Polymer Chemistry concentration
Theoretical Chemistry Concentration

PhD

The faculty of the Department of Chemistry at the University of Tennessee, Knoxville, seek to prepare their students to join the international ranks of professional chemists in fundamental areas of chemistry as well as cross-disciplinary sciences in which chemical expertise plays a critical role in the development of new knowledge and technologies. Students planning to major in chemistry for the master’s or doctoral degree will ordinarily have attained a satisfactory record in the traditional areas of chemistry. The department, however, recognizes that modern chemistry transcends traditional disciplinary divisions. Therefore, it encourages students with undergraduate majors in chemical engineering, the biological sciences, physics, mathematics, computer science, or other fields to apply for admission to our program.
Admission

Admission to the graduate program is decided on a case-by-case basis, taking into consideration an applicant’s undergraduate record (traditionally including courses in general, analytical, inorganic, organic, and physical chemistry), performance on the general Graduate Record Examination (required), and supporting information such as references from previous faculty and research mentors, co-authorship of research presentations or papers, and awards. Recommendation for a student’s initial course of study in graduate school is based on the desired specialization, previous training and experience, and performance on departmental diagnostic exams administered following arrival in the department.

Interdisciplinary Graduate Minor in Computational Science (IGMCS)

The Department of Chemistry participates in the interdisciplinary graduate minor in computational science (IGMCS) program. Any student pursuing a master’s or PhD with a major in chemistry can receive a minor in computational science by completing the appropriate IGMCS requirements. For additional information, see the description of the Interdisciplinary Graduate Minor in Computational Science listed under Department of Electrical Engineering and Computer Science or visit the IGMCS website at [http://igmcs.utk.edu/](http://igmcs.utk.edu/). The Department of Chemistry also contributes courses to the IGMCS program curriculum.

Interdisciplinary Certificate in Sustainability Science

The Department of Chemistry is one of several departments participating in the Sustainable Technology through Advanced Interdisciplinary Research (STAIR) Program. Any student pursuing a master’s or PhD with a major in chemistry can receive a Certificate in Sustainability Science by completing the appropriate STAIR Program certificate requirements. For further information, see the description of the certificate requirements listed under the Chemical & Biomolecular Engineering catalog.

MASTERS OF SCIENCE
CHEMISTRY MAJOR
Requirements

The requirements for the MS with a major in chemistry consist of the satisfactory completion of the following requirements.

- Research and a thesis to give 6 to 12 hours of graduate credit in CHEM 500.

- Participation in seminar (CHEM 501) during the entire period of graduate study, including the presentation of at least one seminar. (No more than 3 hours may be applied to the course requirements.)
• Prescribed courses based on performance on diagnostic examinations.

• Sufficient graduate course work in chemistry (at the 400 level or above) and/or a related field to make an overall total of 30 hours, including one of the following sequences – CHEM 510 -CHEM 511 -CHEM 513 , three of CHEM 530 -CHEM 531 -CHEM 532 -CHEM 533 , CHEM 550 -CHEM 551 -CHEM 552 , CHEM 570 -CHEM 572 -CHEM 573 or CHEM 590 -CHEM 594 -CHEM 595 . At least 14 hours of this graduate course work must be at the 500 level or above.

• A final oral examination.

DOCTOR OF PHILOSOPHY
CHEMISTRY MAJOR

Requirements

The requirements for the PhD in chemistry (except for the chemical physics concentration) consist of the satisfactory completion of the following requirements.

• Research and a dissertation to give at least 24 hours of graduate credit in CHEM 600 . Registration must be continuous from the beginning of research.

• Participation in seminar (CHEM 501 ) during the entire period of graduate study, including the presentation of at least one seminar.

• Prescribed courses based on performance on diagnostic examinations.

• Completion of the candidacy proposal to give 2 hours of credit in CHEM 603.

• Completion of the original research proposal to give 1 hour of credit in CHEM 604.

• 18 additional hours in courses at the 500 level or above including at least one course above 601 and one of the following sequences: CHEM 510 -CHEM 511 -CHEM 513; CHEM 530 -CHEM 531 -CHEM 532 -CHEM 533; CHEM 550 -CHEM 551 -CHEM 552 -CHEM 553; CHEM 570 -CHEM 571 -CHEM 572 -CHEM 573; or CHEM 590 -CHEM 594 -CHEM 595.

• A final oral examination.

The PhD program with a concentration in chemical physics is conducted jointly with the Department of Physics. Requirements depend on the choice of the major department. Chemistry departmental requirements include passing the above degree requirements plus 6 additional
hours in physics at the 500 level or above. Three of the additional physics hours can be used to satisfy the 18 hours requirement listed above.

Chemistry Courses (235)

430 Advanced Inorganic Chemistry (3) Atomic and molecular structure, bonding theories, descriptive chemistry of the elements, kinetics and mechanism of inorganic reactions, applications of modern techniques for characterization, coordination and organometallic chemistry.
(DE) Prerequisite(s): 230.

450 Advanced Organic Chemistry (3) Modern organic reactions of mechanistic, synthetic, and theoretical interest. Content reflects current trends in the area.
(DE) Prerequisite(s): 360.

471 Biophysical Chemistry (3) (See Biochemistry and Cellular and Molecular Biology 471.)

473 Physical Chemistry I (3) Properties of gases; first, second and third laws of thermodynamics; chemical equilibria; simple phase equilibria; properties of solutions.
Credit Restriction: Students may not receive credit for both 471 and 473.
(DE) Prerequisite(s): 130 or 138 and Physics 136 or 138 or 222 or 231 and Mathematics 241, 247.

479 Physical Chemistry Laboratory I (2) Experiments on topics discussed in 471 or 473.
Contact Hour Distribution: 1 lab.
(DE) Prerequisite(s) or (DE) Corequisite(s): 471 or 473.

481 Biophysical Chemistry (3) (See Biochemistry and Cellular and Molecular Biology 481.)

483 Physical Chemistry II (3) Introduction to statistical thermodynamics; kinetics of chemical reactions; introduction to quantum mechanics and applications to electronic structure of atoms and molecules; molecular spectroscopy.
Credit Restriction: Students may not receive credit for both 481 and 483.
(DE) Prerequisite(s): 130 or 138 and Physics 136 or 138 or 222 or 231 and Mathematics 241, and 247.

489 Physical Chemistry Laboratory II (2) Experiments on topics discussed in 481 or 483.
Contact Hour Distribution: 1 lab.
(DE) Prerequisite(s) or (DE) Corequisite(s): 481 or 483.

500 Thesis (1-15)
Grading Restriction: P/NP only.
Repeatability: May be repeated.

501 Chemistry Seminar (1) Lectures and discussion on current research. Continuous registration is required for resident graduate students.
Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated. Maximum 14 hours.

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.
Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated.
Credit Restriction: May not be used toward degree requirements.

505 Special Problems (3) Specially assigned theoretical or experimental work on problems not covered in other courses.
Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated. Maximum 6 hours.
Registration Permission: Consent of department.

510 Analytical Spectrometry (3) Principles and practice of optical and mass spectrometric techniques in quantitative chemical analysis.
Recommended Background: 2 semesters of physical chemistry.

511 Analytical Separations (3) Principles and practice of chemical separations based on extraction, chromatographic, and electrophoretic phenomena.
Recommended Background: 2 semesters of physical chemistry.

512 Electroanalytical Chemistry (3) Fundamentals of electrode processes; principles and practice of electroanalytical techniques in quantitative chemical analysis and applied to study of chemical systems.
Recommended Background: 2 semesters of physical chemistry.

513 Mass Spectrometry and Surface Characterization (3) Principles, development, and practice of modern mass spectrometric and surface characterization tools, including discussion of ion chemistry. Emphasis is on instrumentation.
Recommended Background: Undergraduate course work in instrumental analysis and physical chemistry.

530 Chemical Bonding (3) Wave mechanical atom, group theory, quantum approach to molecular orbital theory, covalent, ionic, and metallic bonding, ligand field theories, solid state.
Recommended Background: 1 semester of inorganic chemistry.
531 Characteristics of Inorganic Compounds (3) Descriptive chemistry of elements; structure, reactions, kinetics, mechanisms, equilibria, and spectra of coordination, organometallic, bioinorganic compounds.
Recommended Background: 1 semester of inorganic chemistry.

532 Experimental Methods of Inorganic Chemistry (3) Electronic, infrared, Raman, microwave, NMR, ESR, nuclear quadrupole, Mossbauer, mass, and photoelectron spectroscopies for characterization of inorganic compounds.
Recommended Background: 1 semester of inorganic chemistry.

533 Chemistry of the Transition Metals (3) Theoretical and experimental foundations of modern coordination, organometallic, and bio-inorganic chemistry of transition metals; transition metal mediated catalysis, materials chemistry, isolobal theory, kinetics and mechanism of reactions of transition metals, and applications in organic synthesis.
Recommended Background: 1 semester of inorganic chemistry.

550 Structure and Reactivity in Organic Chemistry (3) Structure and bonding in organic compounds; molecular orbital theory, stereochemistry, conformational analysis, and molecular mechanics; substituent effects on acidity and reactivity; introduction to reaction mechanisms.
Recommended Background: 2 semesters of organic chemistry.

551 Organic Reactions (3) Organic transformations of use in synthesis; carbonyl chemistry and carbon-carbon bond formation; stereochemistry and regiochemistry of synthetic processes.
(DE) Prerequisite(s): 550.

552 Applications of Organic Reactions (3) Applications of organic reactions to directed synthesis targets including bio-organic substrates, natural products, medicinal agents, or other molecules of practical or theoretical interest.
(DE) Prerequisite(s): 550.

Recommended Background: 2 semesters of organic chemistry.

570 Quantum Chemistry and Spectroscopy (3) Basic principles of quantum mechanics and their applications to molecular orbital theory, molecular structure, and spectroscopy; introduction to group theory.
Recommended Background: 2 semesters of physical chemistry.

571 Advanced Quantum Chemistry and Spectroscopy (3)
(DE) Prerequisite(s): 570 or consent of instructor.
572 Thermodynamics and Statistical Mechanics (3) Macroscopic and microscopic description of equilibrium systems. Basic principles of thermodynamics and statistical mechanics, and application to selected chemical systems.

*Recommended Background: 2 semesters of physical chemistry.*

573 Chemical Kinetics and Transport (3) Time-dependent phenomena in chemistry: chemical kinetics, chemical dynamics, transport theory.

*Recommended Background: 2 semesters of physical chemistry.*

590 Polymer Chemistry (3) Fundamentals of polymer synthesis and characterization through application of organic and physical chemical principles.

*Recommended Background: 2 semesters of organic chemistry and 2 semesters of physical chemistry.*


*(DE) Prerequisite(s): 590 or equivalent.*

595 Physical Chemistry of Polymers (3) Conformation of macromolecules, solution and bulk properties, rubber elasticity, kinetics of polymerization, polymer thermodynamics.

*(DE) Prerequisite(s): 590 or equivalent.*

600 Doctoral Research and Dissertation (3-15)

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

603 Candidacy Research Proposal (2) Preparation of a candidacy proposal (CP) based on current and proposed research and oral defense of the CP that demonstrates an in depth and broad perspective.

*Grading Restriction: Satisfactory/No Credit grading only.*

*Registration Restriction(s): Minimum student level - graduate.*

*Registration Permission(s): Consent of department head.*

604 Original Research Proposal (1) Preparation and oral defense of an original research proposal based on thorough survey of chemical literature.

*Grading Restriction: Satisfactory/No Credit grading only.*

*Registration Restriction(s): Minimum student level - graduate.*

*Registration Permission(s): Consent of department head.*

610 Selected Topics in Analytical Chemistry (3) Topics of current significance.
Repeatability: May be repeated. Maximum 12 hours.
(DE) Prerequisite(s): 510, 511, and 512 or consent of instructor.

630 Selected Topics in Inorganic Chemistry (3) Topics of current significance.
Repeatability: May be repeated. Maximum 12 hours.
(DE) Prerequisite(s): 530, 531, and 532 or consent of instructor.

650 Selected Topics in Organic Chemistry (3) Topics of current significance.
Repeatability: May be repeated. Maximum 12 hours.
(DE) Prerequisite(s): Any two of 550, 551, 552 or consent of instructor.

670 Selected Topics in Physical Chemistry (3) Topics of current significance.
Repeatability: May be repeated. Maximum 12 hours.
(DE) Prerequisite(s): 570, 572, and 573 or consent of instructor.

690 Selected Topics in Polymer Chemistry (3) Topics of current significance.
Repeatability: May be repeated. Maximum 12 hours.
Registration Permission: Consent of instructor.

691 Selected Topics in Thermal Analysis of Polymeric Materials (3)
Topics of current significance.
Repeatability: May be repeated. Maximum 9 hours.
Credit Restriction: Maximum 3 hours may be applied toward the chemistry major.
Registration Permission: Consent of instructor.
Appendix 3

Forms Used by graduate Students

The following forms can be found at http://gradschool.utk.edu/gradforms.shtml

Graduate Student Forms

Graduation Forms
All the forms are in interactive PDF. Refer to the instructions at the bottom.

Master's Student Forms

- Admission to Candidacy Application* PDF (79 KB)
  - Candidacy Application FAQs
  - Revision to Master's and Ed.S. Candidacy Application PDF (56 KB)
- Graduation Application - found on MyUTK / "Student Records" / "Apply to Graduate"
- Report of Final Exam/Defense of Thesis (Pass/Fail) Form* PDF (34 KB)

Doctoral Student Forms

- Admission to Candidacy Application* PDF (43 KB)
  - Candidacy Application FAQs PDF (15 KB)
- Doctoral Committee Appointment Form* PDF (26 KB)
- Graduation Application - found on MyUTK / "Student Records" / "Apply to Graduate"
- Report of Final Exam/Defense of Dissertation (Pass/Fail) Form* - Committee Chair receives form from Graduation Specialist
- Scheduling Defense of Dissertation Form* PDF (21 KB)
- Survey of Earned Doctorates (SED) Web Registration. More about SED Registration.
List of Important Websites for Graduate Students

- [http://registrar.utk.edu/](http://registrar.utk.edu/) - Registrar’s Office
- [http://gradschool.utk.edu/](http://gradschool.utk.edu/) - The University of Tennessee Graduate School
- [http://gradschool.utk.edu/gradforms.shtml](http://gradschool.utk.edu/gradforms.shtml) - Important Forms for Graduate Students
- [http://gradschool.utk.edu/ddategraduation.shtml](http://gradschool.utk.edu/ddategraduation.shtml) - Deadline Dates and Commencement Information for Graduation
- [http://gradschool.utk.edu/graduation.shtml](http://gradschool.utk.edu/graduation.shtml) - Graduation Information for Graduate Students (Including the Necessary Forms)
- [http://studenthealth.utk.edu/insurance.php](http://studenthealth.utk.edu/insurance.php) - Student Health Insurance
- [http://catalog.utk.edu/](http://catalog.utk.edu/) - Graduate Catalog (choose the appropriate catalog using the drop-down list in the upper right hand corner!)
- [http://graduateadmissions.utk.edu/](http://graduateadmissions.utk.edu/) - Graduate Admissions