Welcome to the graduate program in chemistry at Middle Tennessee State University. We hope your stay here will be a productive one. This handbook has been prepared to inform you of some of the procedures and deadlines required to successfully complete the M.S. program. However, while this handbook covers many of the items you will need to know as a graduate student, it is not exhaustive. If you have any questions do not hesitate to ask the M.S. program coordinator. Good luck.

Admissions
In addition to the general admission requirements of the Graduate School, (bachelor’s degree with a minimum 2.75 GPA) applicants to the M.S. program in Chemistry must:

1. Have an undergraduate minor in chemistry or its equivalent at the time of admission.

   NOTE: Although there are no specific course requirements for admission, all chemistry students must take or have taken Quantitative Analysis before graduation. For those students who have not taken Quantitative Analysis as an undergraduate, they must take CHEM 2230 as a prerequisite for CHEM 6230 Intermediate Analytical Chemistry.

2. Achieve a satisfactory score on the Graduate Record Examination.

Graduation Requirements
To receive the M.S. in Chemistry from MTSU, the candidate must:

1. Complete a minimum of 30 semester hours with no more that 30 percent of the total degree hours dually listed as undergraduate/graduate hours.

2. Complete the following core curriculum:

   CHEM 6100 Intermediate Organic Chemistry (3 hours)
   CHEM 6400 Intermediate Inorganic Chemistry (3 hours)
   CHEM 6230 Intermediate Analytical Chemistry (4 hours)
   CHEM 6300 Intermediate Physical Chemistry (3 hours)

   Exceptionally well-prepared students may take a proficiency exam to qualify to take a more advanced course in place of the core course.
3. Complete and present an original thesis approved by the student’s advisory committee:
   - CHEM 6870 Chemistry Research (3 hours)
   - CHEM 6800 Chemistry Seminar (1 hour)
   - CHEM 6640 Thesis Research (variable)

4. Complete a minimum of 5 credit hours of additional approved chemistry graduate courses, or approved cognate courses in biology, mathematics, computer science, or physics.

5. File a Candidacy Form with the Graduate Office prior to the completion of 24 credit hours and annually work out a plan of study for the next twelve months with the academic advisor.

6. Successfully complete five of six written comprehensive examinations in the following areas of chemistry: analytical/instrumental, biochemistry, general, inorganic, organic, and physical chemistry.

Graduate Assistantships

Students in the graduate program in Chemistry are generally offered a graduate teaching assistantship. The initial appointment usually requires a 3.0 undergraduate GPA. Those students not meeting this requirement may ask the Graduate School to grant an exception. The assistantship pays a small monthly stipend, along with tuition and most of the general access fee. In return, graduate teaching assistants are required to work 8 contact hours in the Chemistry Department. In general this will entail acting as a teaching assistant in chemistry or physical science laboratories. Most chemistry laboratories are 3 contact hours (CHEM 1030 is an exception), while physical science laboratories are 2 contact hours. Therefore most teaching assistants will be required to oversee two chemistry laboratory sections or three physical science laboratory sections per week. The remaining contact hours will be assigned depending upon the needs of the chemistry department and may entail working in the Chemistry Department office, the stockroom, additional chemistry laboratories, or other duties.

Graduate teaching assistants responsible for a laboratory section are required to answer student questions about lab procedures, enforce safety regulations, grade lab reports, submit grades to the lab instructor, and may be required to prepare a weekly briefing for the students in the laboratory. The faculty member in charge of your particular laboratory will determine your actual duties. The graduate teaching assistant will generally not be responsible for setting up the laboratory although this may vary with the individual laboratory. Because of the amount of time required to teach laboratories, if you hold a full-time job, you should consider not accepting an assistantship.
Dr. Gary White holds a training session at the beginning of the semester. Attendance at this meeting is mandatory and you will be notified of the date of this meeting. This session will include information on safety and emergency procedures.

To retain your assistantship, you must be a full-time graduate student (registered for 6 graduate hours) and maintain a "B" average (3.00 GPA). In addition graduate assistants are evaluated at the end of every semester and you must maintain a satisfactory rating to be retained. Assistantships are generally renewable for four (4) semesters, not including summer semesters, upon satisfactory discharge of your duties.

There is considerable paperwork that is associated with the granting of your assistantship. This includes the completion of a W-4 form in the chemistry office. This form must be completed before the start of your first semester. For international students there are even more forms to fill out. You should consult with the chemistry office in advance of the start of the semester to ensure that your paperwork is complete so that you will receive your paychecks on time.

**Coursework**

Every graduate student is required to accumulate thirty hours of credit to graduate with an M.S. degree in chemistry. The thirty hours include a minimum of six lecture classes, plus chemistry seminar, chemistry research, and thesis research.

Of the six lecture classes, four are required in the core areas of analytical/instrumental, inorganic, organic, and physical chemistry. All graduate students must therefore take and pass the following core courses:

- CHEM 6230 Intermediate Analytical Chemistry
- CHEM 6400 Intermediate Inorganic Chemistry
- CHEM 6100 Intermediate Organic Chemistry
- CHEM 6300 Intermediate Physical Chemistry

The core courses are broad-based and provide some review of undergraduate material and some graduate level material. The core courses are good preparation for the comprehensive examinations, which all graduate students must pass. Of the four core courses three are lecture only, while the analytical/instrumental core course has a laboratory component and is worth four credit hours. In addition Intermediate Analytical Chemistry (CHEM 6230) has a prerequisite of Quantitative Analysis (CHEM 2230) while the other three core courses do not have prerequisites. However it is expected that all students will have taken two semesters of organic chemistry as part of their undergraduate curriculum. Generally two core courses are offered each semester. In the fall semester Intermediate Organic Chemistry (CHEM 6100) and Intermediate Analytical/Instrumental Chemistry (CHEM 6230) are offered, while in the spring...
semesters, Intermediate Inorganic Chemistry (CHEM 6400) and Intermediate Physical Chemistry (CHEM 6300) are offered. The courses also rotate between day and night offerings.

In addition to the core courses described above, there is a core course in biochemistry (CHEM 6500 Intermediate Biochemistry) that is taught every other year. It is not required of M.S. students, but counts as one of the two elective courses. If you have not had a previous course in biochemistry it is strongly urged that you take this course or another biochemistry course as preparation for the comprehensive exam.

In addition to the four core courses required of all students, two electives are required. These electives may be in any area of chemistry or may be in related areas such as biology or math. Permission of the M.S. coordinator is required to take courses outside the area of chemistry. You should be aware that not all elective courses are offered every year and should plan your course of study accordingly.

The remaining hours consist of research-related courses. Chemistry Research (CHEM 6870) provides instruction on writing your thesis and is generally taken soon after you have begun your research. Thesis Research (CHEM 6640) is a variable credit pass/fail course that may be taken multiple times (A maximum of 8 hours will count toward the 30 hours to graduate.) Chemistry Seminar (CHEM 6800) is also required of all students and is taken near the end of your research.

**Registration for courses**

You must register for courses each semester. At the beginning of the registration period, an M.S. Course Request Form will be placed in your mailbox. If you have a research advisor, consult with him or her and then bring the form to the M.S. coordinator. If you have not yet chosen a research advisor, bring the form directly to the M.S. coordinator for consultation. If you are registering for Chemistry Research or Thesis Research, it will be necessary to create these sections before you can register. Therefore, once you have obtained the signature of the M.S. program coordinator on the course request form, you must visit the Chemistry Office and have the departmental secretary create the sections and grant Permissions of Department. Once the sections have been created it is necessary to register using the PIPELINE system. It is imperative that you register during the preregistration period (mid-November for spring semester; early April for summer and fall semester). Advanced courses that have insufficient numbers of students preregistered may otherwise be cancelled before the semester begins. Failure to do so may endanger your graduate assistantship, delay your paycheck, create additional work for the departmental secretaries and M.S. coordinator and cost you a late registration fee of $100.
Mailboxes
Each graduate student is assigned a departmental mailbox, located in Room 233 of the Davis Science Building, along with a university mailbox located in the Keathley University Center. You should check your departmental mailbox once a day for announcements and messages from the department and the faculty.

Keys/I.D. Cards
Once you begin work in the M.S. program, you will be given I.D. card swipe access to allow you access to the building and certain labs outside of normal business hours. Special keys are issued by the departmental secretaries and become your responsibility once issued. When you have completed your M.S. degree, it is your responsibility to return the keys to the departmental secretaries. Failure to do so may result in a charge and the withholding of your degree. In addition, you should not lend your keys to another student.

Admission to Candidacy Forms
Each student is required to file an Admission to Candidacy Form with the Graduate Office before completing 24 graduate credit hours. The usual time to file this form is the end of your second semester in residence. The Admission to Candidacy Form is a list of the courses you have taken and plan to take to earn the M.S. in Chemistry. A copy of the form is located in the back of this handout. Once you have completed the form, it should be taken to the M.S. coordinator for his or her signature and then to the Graduate Office for approval. Once the Candidacy Form has been approved, the Graduate Office will return a copy to the M.S. coordinator to be kept on file. Any change in this form requires permission from the Graduate Office in writing.

Selection of Research Advisor
The selection of a research advisor is one of the most important decisions you will make in graduate school. The research advisor not only affects the particular project you will work on, but your research advisor will have a profound effect on your development as a scientist. The research advisor will shape your attitudes toward research and science in general. Therefore it is necessary that you carefully consider your choice of research advisor. You will begin your selection by considering the area of chemistry in which you are interested. This process generally starts in the beginning of your first semester in graduate school. A good place to start the selection process is the departmental web page. This contains a short summary of the research interests of each of the faculty member in the department. By the middle of the first semester you should begin interviewing faculty members about their interests. Most faculty members are more than happy to discuss their research with you, so do not hesitate to approach them. You are required to interview at least three faculty members and fill out the form found in the back of this handout. You should complete your interviews by the middle of your
second semester at MTSU. Once you have decided on your choice of research advisor you must formally request permission to work with a particular faculty member and obtain their signature on the form naming them as your research advisor. Be aware that some faculty members may not be able to accept you as a research student. Do not be discouraged, and do not take the decision of a research advisor to not allow you to work in their laboratory personally. Most likely the decision is a reflection of several factors, including the number of students they already have working for them, the amount of time they are able to spend in the laboratory, the amount of space they have available in the laboratory, and the resources such as equipment and funding they have available. Once you have secured the necessary signatures, the form should be returned to the M.S. program coordinator. The deadline for the submission of this form is the end of your second semester at MTSU.

Research Project
After you have chosen a research advisor you must decide on a research project. This is done in consultation with your advisor. Your advisor will lay out a project that is consistent with his or her interests, with your interests, and which can be done within a reasonable amount of time with the equipment and resources available at MTSU. You are strongly urged to prepare a short description of the research program, including an introduction to the project, the goals to be accomplished, and if possible, the methodology that will be used to accomplish those goals. This research plan may avoid any misunderstandings that might arise between yourself and your research advisor as your research nears its ends.

Formation of Research Committee
Once you have agreed upon a project with your research advisor, a committee of readers must be chosen. Three members of your research committee consist of your research advisor, the Department Chairperson, and Dr. Preston MacDougall. Again in consultation with your research advisor, you should approach one additional faculty member and request that he/she serve as a reader on your research committee. This faculty member should possess some expertise in an area that is integral to your thesis. By the end of your third semester in residence you must submit to the M.S. Graduate Coordinator the form naming your committee members.

Seminar
The Department of Chemistry holds weekly seminars from 4:00 – 5:00 on Fridays and seminars will be announced in advance. Seminar speakers include invited outside guest lecturers, faculty members, and graduate students completing their research. Dr. Charles Chusuei, the seminar director, will distribute the schedule of speakers at the beginning of each semester. All M.S. students are required to present a seminar describing their research. This is the defense of thesis. Normally this is done during the semester in which you plan to graduate.
A notice with the title of your seminar and an abstract must be completed approximately 10 days in advance of your seminar. The seminar announcement must be no longer than two letter-size pages (i.e. both sides of a single page) and consists of a standard heading, an abstract of typically 200 – 300 words in length, and your most important literature references. References and other conventions should follow the format of The ACS Style Guide.

For those semesters in which you are not registered for CHEM 6800, you are expected to attend seminar. Attendance at seminar serves a number of purposes. It exposes you to the current chemical literature, both published and unpublished, and also introduces you to areas in chemistry that you may not normally encounter. In addition, as you are required to present a seminar, it is imperative that you be aware of what constitutes a good seminar as well as shortcomings and errors that produce a poor one. Seminar is considered an essential part of the graduate program.

Failure to attend seminars will lead to students holding GTA positions to lose their position. For students not holding GTA positions, failure to attend may result in a grade of “I” for research that semester. Occasional, excused absences will be allowed, and other scientific seminars may be used in place of missed Chemistry seminars.

Intent to Graduate Form
You are required to submit an Intent to Graduate Form in the semester you plan to graduate. This form is available on the Graduate Office website. You must be aware of the deadline for filing this form as it changes from semester to semester. If for some reason you do NOT graduate in the semester you have indicated, you must file a new Intent to Graduate Form the next semester although you will not be charged another graduation fee.

Thesis
The bulk of your time in the M.S. program will be spent carrying out your research and writing the results in a thesis. It is generally accepted that to make adequate progress on your thesis, you must spend 40 – 50 hours per week on research to complete the thesis in time. This is in addition to the amount of time you are required to spend teaching laboratories.

The Graduate Office has prepared a handout covering some of the style requirements of the thesis. You should obtain a copy of this handout before you begin writing your thesis and become familiar with its requirements. You should also have access and be familiar with the latest edition of the ACS Style Guide for reference. A copy of this reference is available at Phillip's Bookstore. You should be aware of the deadline for submitting a thesis to the Graduate Office as they change every semester.
The deadline for submitting a thesis to the Graduate Office is fairly early in the semester and the Graduate Office has made it clear it will not extend the deadline. In addition you should provide your committee members a copy of your complete thesis (proofread and approved by your advisor) for their review at least two weeks in advance of any deadline. Faculty members have many other duties and cannot drop everything else because you have a thesis to be read. The copy of your thesis that is given to the Department Chairperson, the Assistant Chairperson, and the other committee members should first go through several drafts in consultation with your research advisor. A thesis that contains numerous misspellings, grammatical errors, and typos reflects badly on both you and your research advisor. The copy that goes to the Graduate Office should be carefully reviewed for errors. The Graduate Office has returned theses to the department disapproved solely because it contained too many misspellings and typos.

Usually, the final corrected version of the thesis must be submitted to the Graduate Office by the 10th week of the fall and spring semesters. (The deadline is even earlier in the summer semester.) This means the thesis should be submitted to your committee by the 8th week of the semester in which you intend to graduate. In addition you should realize that it will take most students two to three months of solid work to prepare their thesis for submission to their committee. See the Timetable below for suggested dates for completing the various stages of writing the thesis, assuming graduation in the summer of the second year.

**Thesis Committee**

The department has approved a policy that requires that MS students meet with their thesis committee each semester to review their progress. A form will be placed in your mail boxes each semester (not including summers) that must be filled out and completed by the end of the semester. Failure to complete this form can lead to loss of your GTA position.

**Defense of Thesis**

Your thesis defense/seminar must be announced to the entire department at least one week before it is held. The format of the seminar consists of a public presentation approximately 45 minutes in length followed by a question and answer period. During the presentation, the student is expected to present a clear statement of the problem or project, the significance of the problem, a short but comprehensive review of the relevant literature, the experimental techniques used to study the problem and the conclusions drawn based upon your experimental work. It is expected that the bulk of the presentation will concentrate on your work and its analysis. Describe the methods and procedures used and the data collected in sufficient detail to justify your conclusions. At the end of the presentation, audience members will be given a chance to ask questions based
upon the presentation. Once the questions are over, the candidate and committee will meet in a closed session to administer the oral examination. The oral exam will include questions that assess the candidate’s ability to integrate scholarly information gained through coursework and its relationship to the student's major and related fields. Note that any faculty member may submit questions to the committee that they feel should be asked. If the student’s committee judges that the student failed to demonstrate the required level of understanding, a second attempt will be administered that addresses the specific shortcomings. The second attempt may be another oral or a written exam as determined by the student’s M.S. research committee. Your grade will be based upon the effectiveness of your thesis defense as judged by your M.S. research committee.

**Final Cleanup**

Your final duty after completing your thesis and your chemistry seminar will be to cleanup your research area. You should consult with your research advisor as to the disposal and retention of chemicals and products generated during your research. You must also present your notebooks and other research related materials to your research advisor before leaving school. Also all keys must be returned to the Departmental office.

This booklet has been written in an attempt to inform you of some of the major policies, procedures, and deadlines that you will encounter during your matriculation as an M.S. student in the Department of Chemistry. However no booklet can answer every question, and it is your responsibility to be aware of any material not covered in this booklet. If you have questions, consult your thesis advisor or the M.S. program coordinator.

**Student Complaint Policy**

In cases where there is a conflict between a graduate student and his/her faculty research advisor or GTA supervisor and this conflict cannot be resolved between the involved parties, the next step is to bring the conflict to the chair of the MS committee who, either alone or with members of the MS committee, will attempt to mediate the situation and create plan of resolution. Should this fail, the situation will be brought to the department chair, who will handle the situation, including potentially transferring the student to a different mentor/supervisor.
Timeline
The following timeline is the typical path a graduate student (on GA support) will follow from entering the M.S. program in Chemistry to graduation.

Semester 1 (Fall)
Register for two core courses:
  Intermediate Organic Chemistry
  Intermediate Inorganic Chemistry
Graduate assistants need to be registered for two graduate courses; well-prepared students should seriously consider registering for a third (elective) course.

Begin interviews of prospective research advisors; if possible select advisor.

Semester 2 (Spring)
Register for two core courses:
  Intermediate Physical Chemistry
  Intermediate Analytical Chemistry
Well-prepared students should begin research or select an elective.

By the middle of the semester submit choice of research advisor to the graduate coordinator.

File Admission to Candidacy form.

First Summer Semester
Begin or continue research.

Students who have not taken all of their required courses may consider registering for at least one course.

Semester 3 (Fall)
Continue/complete research.

Register for Chemistry Research (CHEM 6870), and begin writing thesis.

Complete course requirements if not already done.

Semester 4 (Spring)
Register for Chemistry Seminar (CHEM 6800), and present seminar.

Complete research.

Submit first draft of thesis to major professor: about Feb. 23.
Submit second draft of thesis to major professor: about Apr. 4.
Submit third draft of thesis to major professor: about Apr. 18.
Submit corrected thesis to second reader: about May 2.

**Second Summer Semester**
File Intent to Graduate form.

Submit revised, corrected thesis to Assistant Chair: about May 16.
Submit revised, corrected thesis to Chair: about May 30.
Submit fully corrected and signed thesis to Graduate office: about June 9
(see Graduate Catalog for exact date)

Defend thesis.

PCK 8/3/04; revised GPW 8/15/06; revised STH 9/15/09, revised DJP 8/11/15

**Forms**
- Selection of Research Advisor
- Selection of Committee Members
Student Section:

I have interviewed the following three faculty members and have decided to work with ________________________________.

1. _______________________________________
2. _______________________________________
3. _______________________________________

____________________________________     ______________
Student                        Date

Advisor Section:

I agree to serve as Research Advisor to the student named above and in so doing certify that I have adequate time, space, and facilities available for the student to successfully complete his/her degree project.

____________________________________     ______________
Advisor                          Date

Committee Approval:

____________________________________     ______________
Graduate Coordinator              Date
NAME: ________________________ _________________________
(Last)              (First)                (Middle)

ADDRESS: ______________________________________________
(Street)
______________________________________________
(City)               (State)             (Zip)

I agree to serve as a member of the research committee to the student named above.

NAME OF COMMITTEE MEMBERS:

_____________________________________   __________________
(Major Professor)                          (Date)
_____________________________________   ______ ________________
(Committee Member)                       (Date)
_____________________________________   ______ ________________
(Committee Member)                       (Date)

Dr. Greg Van Patten, *ex officio* member as Department Chair
Dr. Preston MacDougall, *ex officio* member as Assistant Department Chair

The committee members for the above named student are approved.

____________________________________   ______ _________________
(MS Program Coordinator)                  (Date)
MTSU

Advancement to Candidacy Form for Masters' or Specialists' Degree Programs

College of Graduate Studies • Office of the Dean • Middle Tennessee State University

1. A copy of your candidacy form should be submitted to the College of Graduate Studies according to your program's curricular requirements.
2. Please list course number & department, course title, and semester hours of credit as indicated below.
3. Secure the signatures of the appropriate persons and submit the signed form to the College of Graduate Studies, Room 114, Cope Building.

<table>
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<th>Course ID # (Including Prefix)</th>
<th>Course Title</th>
<th>Sem. Hours</th>
<th>Grade</th>
<th>IF APPLICABLE: Transfer Credit Taken Prior to Attending MTSU Transfer Institution</th>
<th>Substitute for MTSU Course#</th>
<th>Dept. Approval for Transfer Credit</th>
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Total hours: 30

Language Research Tools (if relevant)

Signature of Candidate: ____________________________ Date: _____________

Signature of Graduate Advisor: ____________________________ Date: _____________

Signature of Minor Advisor: ____________________________ Date: _____________

Signature of Teacher Licensing Analyst: ____________________________ Date: _____________

Signature of Dean, College of Graduate Studies or Graduate Analyst: ____________________________ Date: _____________

MST & MAT Students, only:

Signature of Chair of Educational Leadership Department or Elementary Education Department: ____________________________ Date: _____________