

Middle Tennessee State University

Department of Chemistry Master's Program

Graduate Student Handbook

Revised August 2022

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 MS 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 MS program coordinator, Dr. Charles Chusuei. We wish you the best of success!

Admissions

In addition to the general admission requirements of the Graduate School, (for example, bachelor's degree with a minimum 2.75 GPA for unconditional admission) applicants to the MS 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 MS in Chemistry from MTSU, the candidate must:

1. Complete a minimum of 30 semester hours with no more than 30 percent of the total degree hours dually listed as undergraduate/graduate hours (5000-level classes).
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 6 credit hours of additional approved chemistry graduate courses, or approved cognate courses in biology, mathematics, computer science, or physics.
4. Complete and present an original thesis approved by the student's research committee:

CHEM 6870	Chemistry Research (writing course)	(3 hours)
CHEM 6800	Thesis Defense	(1 hour)
CHEM 6640	Thesis Research	(8-19 hours)

5. File a Degree Plan with the College of Graduate Studies prior to the beginning of your first semester. Get course suggestions from the academic program coordinator/advisor. After choosing a research advisor you may decide that you wish to change the elective courses in your degree plan. This may be done by filing a Change in Degree Plan form with the College of Graduate Studies.
6. Successfully complete a CHEM 6800 seminar and a defense of thesis.

Students have six years after the date they matriculate to complete the requirements for the master's degree. This causes no difficulties for fulltime students, but can cause difficulties for students who are working outside the department fulltime if they take semesters off. (Exceptions to the time limit can be granted by the Associate Dean of the Graduate School for good cause.)

Graduate Assistantships

Students in the graduate program in Chemistry are generally offered a graduate teaching assistantship. The purpose of the GTA is to assist you in completing your independent research, leading to the MS thesis. The initial appointment requires full admission and a 3.00 GPA in undergraduate work and/or the latest graduate degree work attempted. 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.

Mr. Ben King typically 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 remain a full-time graduate student (registered for 6 graduate hours/min) and maintain a "B" average (3.00 GPA). Consider a "B-" to be a failing grade. In addition, graduate assistants are evaluated at the end of every semester and you must maintain a satisfactory rating. If you quit the program during a semester, you are required to pay back the cash value of the assistantship for the entire semester! (Note: this is a graduate school policy, not that of the Chemistry Department). You must register for your courses by **Jan 1st** prior to the Spring semester and by **Aug 1st** prior to the fall semester to ensure proper assignment of classes for you to teach.

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.

The duties for the summer session may differ from those for fall and spring semesters. For example, if you have selected a research advisor (before your second semester starts) and he/she is available to work with you during the summer, you may be assigned duties of assisting your advisor for 20 hours a week in their research. Some professors are not available during summers for advising research. If your research professor is unavailable during the summer, or you have not yet selected a research advisor, you may expect to be assigned other duties in the department during the summer.

You must have selected a research advisor by the end of your first semester (Spring or Fall) to retain your teaching assistantship. An **Initial Progress Report** form (page 12) documenting your independent research activities is to be presented in front of at minimum your major research professor and 1 member of the MS committee for approval for continued assistantship support. The presentation and examination is to be given by the end of the summer semester following the Fall or Spring admission. Expectations for the quality of the research presentation by that summer session will be prorated to your semester of admission.

Reasonable, continuous progress towards completing requirements must be maintained on a semester by semester basis, for continued support. If there is ambiguity regarding satisfactory independent research performance, the MS committee may investigate the matter independently. In this eventuality, a report of findings will be made to the MS coordinator to render a decision for continuance or cessation of assistantship support.

Assistantships are generally **renewable for six (6) semesters**, including summer semesters, upon satisfactory discharge of your duties. A seventh semester of support may be available upon request for an extension to the College of Graduate Studies.

Coursework

Every graduate student is required to accumulate thirty hours of credit to graduate with an MS 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. 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 specific prerequisites, although CHEM 6100 assumes a two-semester background in undergraduate organic chemistry. Generally all core courses are offered once a year. Intermediate Organic Chemistry (CHEM 6100) and Intermediate Inorganic Chemistry (CHEM 6400) are normally offered in the fall semester, while Intermediate Analytical/Instrumental Chemistry (CHEM 6230) and Intermediate Physical Chemistry (CHEM 6300) are normally offered in the spring semester.

Below are recommended resources to help you prepare for CHEM 6300:

- Applied Mathematics for Physical Chemistry, Third Edition, by J. R. Barrante, Prentice-Hall, 2003.
- Mathematics for Physical Chemistry, by D. A. McQuarrie, University Science Books, 2008.
- Mathematics for Physical Chemistry, Fourth Edition, by R. G. Mortimer, Elsevier, 2013.

- Physical Chemistry: Quanta, Matter and Change, 2nd ed., by P. Atkins, J. de Paula and R. Friedman, W.H. Freeman and Company, New York, 2014.

<https://global.oup.com/ushe/product/physical-chemistry-9780199609819>

<https://www.amazon.com/Physical-Chemistry-Quanta-Matter-Change/dp/0199609810>

In addition to the four core courses required of all students, five hours of 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 MS coordinator is required to take courses outside the area of chemistry. It may be wise to select your last elective after you have selected your research area, since a particular elective may help you in your research project. However, you should be aware that not all elective courses can be offered every year and should plan your course of study accordingly.

The remaining hours consist of research-related courses. Chemistry Research (CHEM 6870) is generally taken in the fall semester of your second year; in it you write the introductory chapter of your thesis. 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 minimum 30 hours to graduate. A maximum number of 19 total CHEM 6640 hours is permitted; the extra hours is provided as a buffer in case unforeseen events delaying your research (e.g., equipment damage, problems in solving research question, etc.) should you need to register for more research hours. With regard to possible issues to qualify for federal financial aid, it is best to register for the minimum required CHEM 6640 hrs per semester and then load up on any remaining required CHEM 6640 hrs during your terminal semester. Chemistry Seminar (CHEM 6800) is also required of all students, and should be taken only in your last semester in the program (including summers). Note that if you register too soon, this may result in getting an incomplete grade, "I", which if left unmonitored can change into a failing grade, "F".

Registration for courses

You must register for courses each semester. At the beginning of the registration period, an MS Course Request Form is placed in your mailbox. If you have a research advisor, consult with both him or her and the MS coordinator. If you have not yet chosen a research advisor, bring the form directly to the MS coordinator for consultation. If you are registering for Thesis Research, it will be necessary to create these sections before you can register; Permission of Department is needed to register for many of the other courses. Therefore, once you have obtained the signature of the MS program coordinator and your research advisor on the course request form, 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 semesters).** Advanced courses that have insufficient numbers of students preregistered may otherwise be cancelled before the semester begins. Failure to preregister in advance of the semester may endanger your graduate assistantship, delay your paycheck, create additional work for the departmental secretaries, and cost you a late registration fee of \$100. Note that for those who have a GTA, the minimum requirement is 6 credit hours for Fall and Spring. Consult with your major research advisor for what you should take during summer as this varies; the minimum is 1 credit hour. Take heed to not exceed the 19 credit hour maximum for CHEM 6640 for your entire MS degree plan as this will cause financial aid issues with the graduate school.

Departmental Mailboxes

Each graduate student is assigned a departmental mailbox located in DSB 228 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. Card

Once you begin work in the MS program, you will be given card swipe access to allow you access to the building and certain labs outside of normal business hours. Keys are issued by the departmental secretaries and become your responsibility once issued. When you have completed your MS 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 I.D. card to another student.

Admission to Candidacy Forms

After a research advisor has been chosen and a substantial portion of your MS program has been completed, you must file a Thesis Advisory Committee and Advancement to Candidacy Form with the College of Graduate Studies. This form requires a tentative thesis title, your research advisor, and the members of your thesis committee.

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 appendix. 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 they may already have two or more graduate students, they may not have time to work with additional students in their laboratory and/or they may not have enough space or enough equipment and funding. Do not be discouraged, and do not take the decision of a potential research advisor to not accept new students in their laboratory personally. Once you have secured the necessary signatures, the form should be returned to the MS program coordinator. The deadline for the submission of this form is the beginning of your second semester at MTSU. For those who are receiving assistantship support, you should have selected a research advisor by your first semester to retain support (*vide supra*). Submit page 10 to the MS coordinator by the end of your 1st semester.

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. An Initial Progress Report is required by the end of the first semester of the first summer session after admission (*vide supra*).

Initial Progress Report

The purpose of the Initial Progress Report is to help ensure that you have solid foundation for your independent, original research and to minimize experimental obstacles you may encounter, which may unnecessarily prolong the completion of your thesis. Part of being a scientist is to create new knowledge in the field. Hence, it should be expected that there will be unpredictable

aspects in the investigation. We are here to help you finish in a timely manner. Recall that for those of you who depend on GTA support, you are permitted 6 semesters total (counting the summer semesters). For this report, a typical presentation would last 15 minutes plus Q&A. This report may take place in a normal group meeting. At minimum, the presentation should be done in front of the major research advisor and 1 member of the MS committee. This report can be done at any time, but should be completed by the end of the first summer session immediately after admission to the program. An evaluation of satisfactory progress will be made and reported to the MS coordinator (page 12). For those receiving GTA support, a satisfactory report is required for its continuance.

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 the Assistant Chair. Again in consultation with your research advisor, you should approach two additional faculty members 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 MS Graduate Coordinator the form (page 11) naming your committee members.

Seminar

The Department of Chemistry holds weekly seminars from 3:15–4:30 p.m. 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 announcements of seminars. **All MS students are required to present a seminar describing their research. This is the defense of thesis.** Normally this will be done during the semester in which you plan to graduate (summers included). 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 the most important literature references. References and other conventions should follow the format of *The ACS Guide to Scholarly Communication*.

For those semesters in which you are not registered for CHEM 6800, you are still 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 may 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.

All GTA- and GRA-supported MS students by the end of the first summer semester after admission into the program should present a summary of research progress (brief 5-to-10 minutes) to an audience consisting of at least the major research professor, and 1 member of the MS committee for evaluation to retain support.

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 in the Graduate Office. 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 MS 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 and grading 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 Guide to Scholarly Communication* 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 at least two weeks in advance of any deadlines. 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 MS research committee. Your grade will be based upon the effectiveness of your thesis defense as judged by your MS research committee. An examination rubric will be used to review the quality of your overall training (page 14).

Final Cleanup

Your final duty after completing your thesis and your chemistry seminar will be to cleanup your research area (page 13). 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 MS 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 MS 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 (page 13).

Timeline

The following timeline is the typical path a graduate student will follow from entering the MS program in Chemistry to graduation.

Semester 1 (Fall)

Submit Degree Plan to the College of Graduate Studies

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.

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 9/110/15 revised PCK 6/2/16; revised CCC 1/19/18; revised CCC 12/19/19

Forms

- Selection of Research Advisor
- Selection of Committee Members
- Initial Progress Report
- Check Out Procedure
- MS Program Evaluation Rubric

- Dynamic Forms Degree Plan - See the Chemistry Department's website or Graduate Studies website
- Revised Degree Plan - See the Chemistry Department's website or Graduate Studies website

**Middle Tennessee State University
Department of Chemistry
Graduate Research Advisor
Selection Form**

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

**Middle Tennessee State University
Department of Chemistry
Committee Request Form**

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. Andrienne C. Friedli, *ex officio* member as Department Chair

Dr. Dwight Patterson, *ex officio* member as Assistant Department Chair

The committee members for the above named student are approved.

(MS Program Coordinator) (Date)

**Middle Tennessee State University
Department of Chemistry
Initial Progress Report of MS Thesis**

Student Section:

Tentative title of MS thesis project

Student (print)

Date

Faculty Section:

The student is making satisfactory progress towards the completion of his/her independent MS thesis research. Hence, graduate research financial support should be continued.

Major Advisor

Date

Committee Approval:

MS Committee Member

Date

Check-out Procedures for MS Research Students

Students leaving a research group because of graduation or changing to another research group should follow the check-out procedures listed below:

Instructions	Student (initials)	Advisor (check- mark)
1. Students must complete the research goals or tasks determined by their advisors agreed upon for graduate research via CHEM 6640. Those students switching research groups should discuss with their advisors the extent of research needed to fulfill the initial research goals or CHEM 6640 requirements.		
2. (a) All data collected, after processing and interpretation, should be provided to the research advisors and their new research students as a final report to enable the continuation of the research project. (b) The research students must properly label and store all the research samples and inform their advisors or future research students of the locations of these stored samples.		
3. Laboratory notebooks and files containing properly dated data entries and detailed documentation of research results must be returned to the research advisors to enable continuing research.		
4. All chemicals, cell cultures, and laboratory supplies used by the students for their projects must be returned to the designated storage locations. This is necessary to avoid unnecessary expenses in buying these items for continuing research.		
5. Dirty glassware must be cleaned and returned to their shelf space.		
6. Turn in keys to rooms, desks, cabinets, and lab storage units.		
7. Unwanted cultures and waste materials must be properly disposed of by following laboratory safety rules of Chemistry Department.		
8. The student and research advisor should come to an agreement on how to disseminate the research ideas, findings and other intellectual property.		

Student: _____ Signature _____ date: _____

Mentor: _____ Signature _____ date: _____

This form should be submitted to the MS Graduate Committee Chairperson upon completion.

MS Chemistry Program Evaluation Rubric

Student name:

Date:

Rating Scale and Explanations

	1=Unacceptable	2= Poor	3=Average	4=Very Good	5=Exceptional	Rating (1-5)
Knowledge of Discipline (Outcome 1)	Error(s) in exposition of the field and/or omission of key source(s)	Minor errors, omissions, and/ or lack of synthesis	Adequate and accurate exposition of key sources	Good coverage and synthesis of key sources plus additional relevant material	Thorough review and excellent synthesis of sources, including some obscure but relevant ones	
Application of knowledge and methodology to original research topic (Outcome 2)	Discipline and methodology not referenced/applied well	Some links to discipline knowledge and methodology but not clearly integrated	Adequate connection of discipline and use of methodology and research	Clear reasoning with organized presentation of evidence, assumptions	Clear and organized argument that represents sound, original, and complex thought	
Critical thinking, how to solve problems (Outcome 2)	Muddled presentation with errors in reasoning and/or without much organization	Reasoning sometimes confused, simplistic, and/or not clearly explained	Adequate reasoning, explanation of assumptions, and supporting evidence, good ability to answer questions posed during presentation	Clear problems encountered and solutions developed to address them	Clear, organized argument that represents original, and complex thought applicable to other research ideas	
Effective Oral Communication (Outcome 3)	Presentation generally unclear, with poor organization and/or marred	Presentation sometimes unclear with weak organization	Presentation organized to convey main points of thesis clearly	Articulate presentation with clear organization and depth	Elegant, confident, and engaging presentation with clear organization and flow	
Effective Written Communication (Outcome 3)	Writing generally unclear, with poor organization and/or marred	Writing sometimes unclear with weak organization	Writing organized to convey main points of thesis clearly	Writing is clear organization and depth	Elegant, confident, and engaging presentation with clear organization and flow	
Appropriate methodology includes safe and ethical practices (Outcome 4)	Errors in methodology selection and/or use	Minor methodological errors and/or omissions	Methodology applied correctly and adequately; appropriate documentation	Methodology applied correctly, explained clearly, and documented well	Mastery of finer points of methodology plus elegant application and/or supplementary	
Overall Quality (not necessarily average of earlier ratings)	Unacceptable	Poor	Average/Acceptable	Very Good	Excellent	

Additional comments: