REQUIREMENTS FOR GRADUATE STUDENTS

Department of Chemistry
Missouri University of Science and Technology

Approved Oct 14th 2026. Annual Review Timeline approved through affirmative vote on Oct 14th 2026.

University rules and regulations supersede those set forth by the department.

These rules apply to all graduate students irrespective of the dates of their start in the graduate program. Note one differentiation in section C.9 based on start date.

Timeline for Mandatory Milestones

Milestone	Timeline
Qualifier Examinations / Qualifying	Fully qualified by the end of 2nd year.
Comprehensive Exam	Completed by the end of 3rd year.
Present Full Departmental Seminar	At least one semester before defense.

Required Hours for Graduate Degrees (Catalog Year 2020 - 2021 and onwards)

Graduate Degree	Total	Lecture	Research	Electives
M.S. w/ thesis	30	18	6	6
M.S. w/o thesis	30	24	0	6
Ph.D. w/ prior M.S.	42	12	24	6
Ph.D. w/o prior M.S.	72	30**	30	12*

* - electives can be used for lecture course/seminar/research.

** - not including seminar course (6010/intro to research)

I. ADMISSION

All graduate students must secure admission to graduate study through the director of admissions. Applicants must submit an official transcript of all their previous work with their applications for admission. Application for an assistantship should be addressed to the Chair of the Department of Chemistry and must also be accompanied by an official transcript and three letters of recommendation.

II. UNDERGRADUATE PREPARATION

The normal undergraduate preparation expected of students who wish to engage in graduate studies in chemistry is a B.S. degree in Chemistry. This includes two semesters each of general, organic, physical, analytical (including instrumental analysis), and one semester of advanced inorganic chemistry. Students with non-ACS accredited degrees or with degrees in other disciplines may, in some cases, have undergraduate courses required as a non-credit portion of the student's program.

III. PLACEMENT EXAMINATIONS FOR ENTERING GRADUATE STUDENTS

Each entering graduate student will be required to take placement examinations before being allowed to register for the first time in a regular semester. The grades on this examination are not entered on the student's permanent record. The examination consists of four parts dealing with analytical, inorganic, organic, and physical chemistry as commonly presented in undergraduate curricula in chemistry. A score of 70% will be considered a passing grade for each section. The placement examination will be used to supplement the student's official transcript(s) in recommending a proper starting point for the student's graduate study in the department as well as acting as the Qualifying Exam for preparation to the Ph.D. degree.

Undergraduate Deficiencies (Placement Examinations): Students are required to demonstrate competency in analytical, inorganic, organic, and physical chemistry (Section III). After completion of all of the placement examinations (in the week before the start of the semester), students will be given their results on each exam. Based on consultation with an advisor or advisory committee, the student may be (a) required to take a course in each area where a deficiency occurs, (b) advised to take a course in area(s) where lesser deficiency is noted, or (c) given no recommendation (i.e., signifying adequate preparation for graduate work in the areas).

In consultation with the incoming student, the advisor or advisory committee will make a plan of action which includes the course work required to remove any deficiencies noted. Any changes in the requirements must be approved by the faculty. The division will decide the appropriate course(s) for removal of a deficiency identified by its placement exam. To remove these deficiencies, a grade of "C" or better must be achieved in the course. Deficiencies must be removed by the end of the second year in residence or loss of regular graduate status will result. However, a graduate student cannot have more than three "C" grades from all of his/her coursework. It is anticipated that most students will fulfill any requirements by the end of the first year.

In order to earn a graduate degree or graduate certificate, all students must achieve a cumulative GPA of 3.0 or higher in all graduate work taken at Missouri S&T. Master's and doctoral students must also achieve a GPA of 3.0 or higher for all graduate courses listed on the plan of study (Form 1 for master's students and Form 5 for doctoral students). No substitutions may be made on the plan of study for courses in which the student has earned less than a B grade. All graduate students are required to maintain at least a 3.0 cumulative GPA. If the semester graduate GPA falls below 3.0 the student will be placed on probation for the following semester. If the graduate GPA is not 3.0 or above in the following semester that coursework is taken, the student shall no longer be a candidate for a graduate degree or certificate from Missouri S&T. In cases where a graduate student repeats a course, both the original and repeat grades will be used in calculating the student's GPA, and both will appear on the student's transcript.

IV. REQUIREMENTS FOR ADVANCED DEGREES

The Department of Chemistry offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. Attainment of the Master's degree is not prerequisite to a program of study leading to the Ph.D. degree.

Any student who has obtained a Master's of Science degree in Chemistry from any other institution cannot pursue a second Master's degree in Chemistry at S&T. For M.S. degrees not explicitly in

Chemistry, the applicability of this guideline will be evaluated on a case-by-case basis by the *Graduate Affairs Committee*.

Graduate degrees in chemistry at Missouri S&T are awarded to students who demonstrate scholarly achievement beyond the ordinary. All graduates must pass the teaching workshop with a grade of "B" or better before taking the comprehensive or final defense in pursuit of an advanced degree.

All M.S. students are required to enroll in Chem 6010 every semester except for their terminal semester (only for one semester can the student be excused from Chem 6010). PhD students are required to enroll in Chem 6010 every semester until they become eligible for one credit hour sign-up. Please note that the students become eligible for one credit hour sign-up after they have fulfilled all requirements listed in their program of study, as mentioned in policy memorandum II-20. PhD students may not sign up for seminar during a semester if and only if they are signing up for one research credit.

The incoming graduate students must pass, within the first two semesters of enrollment, a minimum of four regular lecture courses offered by the department with a minimum grade point average of 3.0/4.0. This requirement may be waived [by the Chair of the Department] if merited by high performance on the placement examination. The time limit may be extended to a maximum of four semesters by the Chair of the Department in the case of a student admitted with a deficiency in one or more areas of chemistry.

Presently approved regular lecture courses in six major areas of chemistry are listed below. At least three of these six major areas of chemistry must be represented in the student's regular courses. Students will be informed when changes in the list are approved by the chemistry faculty.

a) Analytical Chemistry: Chem 5510, 5710, 6510, 6555, 6570
b) Biochemistry: Chem 5610, 5619, 5620, 5630, 6650
c) Inorganic Chemistry: Chem 5310, 6330, 6380, 6320
d) Organic Chemistry: Chem 5210, 5220, 6220, 6240, 6250
e) Physical Chemistry: Chem 5410, 5420, 5430, 6450
f) Polymer Chemistry: Chem 5810, 5850, 6820, 6840

A. Master of Science in Chemistry (*with* Thesis)

(A.1.) Complete a minimum of 30 credit hours of acceptable graduate work, including the following minimum credits: 18 hours of 5000/6000-level lecture courses, and 6 hours of Chem 6099 (research). The *Graduate Catalog* recommends that 6 of the 30 credit hours be obtained in out-of-department courses. No more than 12 total hours of research, special problems, special investigations, special readings, and graduate seminar can be applied to the 30-hour minimum.

(A.2.) Conduct a research program and write a satisfactory thesis. The M.S. thesis will only be considered by the student's *Graduate Advisory Committee* and the final oral examination scheduled after at least one paper (refereed, peer-reviewed journal) from that thesis has been accepted for publication. The paper should be closely related to the thesis work as evaluated by the student's advisory committee.

(A.3.) Present a full departmental graduate student research seminar before defending.

(A.4.) Pass a final oral examination.

(A.5.) It is required that a M.S. candidate chooses an advisor and submits a planned program of study [Form 1] by the end of the 6th week of their second semester. A three-member advisory committee shall also be selected and reported in Form 1, based on recommendations by the student and the advisor, and approved by the Chair of the Department. To remain in good standing, the student must meet with the advisory committee on an annual basis and have the *Annual Committee Meeting Form* filled out, signed, and returned to the department. The first annual meeting must occur within the first 6 weeks of their 3rd semester in the M.S. program. Specifically, students starting in August will have their first annual meeting in August of the following year, while students starting in January also will have their first annual meeting in January of the following year.

B. Master of Science in Chemistry (*without* Thesis)

The *Department Chairman* will appoint a faculty advisor for students pursuing this degree.

(B.1.) Complete a minimum of 30 credit hours of acceptable graduate work, including the following minimum credits: 24 hours of 4000-, 5000-, and 6000-level lecture courses and at least one graduate course in each of five of the six areas of chemistry listed previously, and 9 hours of 6000-level lecture courses. It is recommended in the *Graduate Catalog* that at least 6 of the 30 credit hours be devoted to courses outside the major department. No more than 4 total hours of special readings, special investigations, special problems, and graduate seminar can be applied toward the 30-hour minimum.

(B.2.) Students who have cumulative GPA of 3.0 and above will be considered qualified for M.S. degree (without thesis). Students with cumulative GPA less than 3.0 will be placed on probation and are expected to increase their cumulative GPA as mentioned in section III, last paragraph above. Failure to do so may result in the student no longer being a candidate for graduate degree from Missouri S&T.

C. Doctor of Philosophy in Chemistry

The Ph.D. degree is awarded for studies focused on original research and merely a minimum of 42 hours of graduate credit as detailed in Section C.4. Note that a student who has not obtained a M.S. in Chemistry (with thesis) at Missouri S&T or elsewhere would require 72 hours of graduate credit as described in Section C.4 and compliant with the graduate catalog.

(C.1.) Students must complete requirements for the Report of Qualifying Exam (Ph.D. Form 4). This requirement is satisfied when the student takes the placement exams and subsequently completes all requirements stipulated as a result of placement exams. The placement requirements should be completed by the end of the second year.

(C.2.) Students must select a *Graduate Research Advisor* and establish a five-member *Graduate Advisory Committee* by the 6th week of the student's second semester. The latter should be approved by the *Graduate Research Advisor* and the *Chair of the Department*. At that time, the students must submit Form 5 with the *Graduate Advisory Committee* selection and degree plan to the department. With the qualification process completed and Ph.D. Form 4 filed, the *Chair of the Department* will sign and forward Form 5 to the *Dean of Graduate Studies*.

(C.3.) The graduate student must meet with the *Graduate Advisory Committee* on an annual basis starting within the spring semester of their 2nd year in the Ph.D. program. Specifically, students

starting in August should have their first annual meeting in their 4th semester, while students starting in January should have their first annual meeting in their 3rd semester. Please note henceforth, regular annual meetings will be only held during the spring semester. The students are required to schedule their annual committee meeting and inform *GAC* by the 1st week of spring semester. The annual committee meeting must be held by the end of the spring semester.

During these meetings, the *Graduate Advisory Committee* should review progress in course work as well as research and have the *Annual Committee Meeting Form* filled out, signed, and returned to the department office and *Graduate Affairs Committee* (GAC). These *Annual Committee Meeting Forms* will be filed in individual students' folder. The GAC will contact students and their advisors if the *Annual Committee Meeting Forms* are not received by the end of spring semester.

The *Graduate Advisory Committee* is expected to make recommendations to the students to address any shortcomings as revealed in the *annual committee meeting* forms.

(**C.4**) If a student plans to schedule their comprehensive examination or thesis defense, the annual committee meeting falling within that calendar year may be coupled with the comprehensive/defense examination at the discretion of the *Graduate Advisory Committee*.

(C.5.) Requirement for 4000-, 5000-, and 6000-level courses. Students who hold a M.S. degree shall be required to complete a minimum of 42 hours of graduate credit. The plan of study must include a minimum of 12 credit hours of 4000-, 5000-, and 6000-level courses. It is recommended that 9 credit hours come from 6000-level courses. Additionally, a minimum of 24 hours of graduate research is required.

Catalog Year 2020 – 2021 and beyond: Students who do not hold a M.S. degree shall be required to complete a minimum of 72 hours of graduate credit. The plan of study must include a minimum of 30 credit hours of 4000-, 5000-, and 6000-level lecture courses. It is recommended that 15 credit hours come from 6000-level lecture courses. Additionally, a minimum of 30 hours of graduate research is required. In some cases, an out-of-department course (e.g., physics, biological science, mathematics, materials science) at the 4000-level or higher may be substituted, if it is appropriate for the plan of study. All of these courses must appear in the plan of study and may include up to 9 hours in graduate transfer credits.

The students are required to sign up for graduate seminar course every semester till they are eligible for ABD (all but defense) status following their comprehensive examination. The credit hours for the seminar course may be counted towards elective.

(C.6.) The *Graduate Catalog* encourages students to elect a minor field of study consisting of at least 12 hours of work outside the major area of specialization.

(C.7.) The Department of Chemistry has no formal requirement for proficiency in any foreign language.

(C.8.) Students must pass a comprehensive examination to the satisfaction of the student's *Graduate Advisory Committee*. The comprehensive exam will comprise of submission of a written synopsis by the student describing their current research project and future directions and an oral presentation focusing on the same, or, if advised by the student's advisory committee, they may submit and defend a research proposal. The comprehensive examination must be completed by the end of the third year of graduate study.

(C.9.) Present a full departmental research seminar either in the fall or spring and at least one semester before the student's Ph.D. defense.

(C.10.) Students must conduct original research, write a dissertation in proper scientific terminology, and provide satisfactory defense of this work in a final oral examination. The Ph.D. dissertation will only be considered by the student's graduate advisory committee and the final oral examination will only be scheduled after at least two peer-reviewed papers have been published or accepted for publication in refereed journal(s) and after one regional or national conference presentation has been given (DoC, the Graduate School, and CASE have several schemes available for providing financial support for students giving oral or poster presentations at regional/national conferences).

The peer reviewed publications counted towards the minimum requirement should comprise a major part/chapter(s) of the student's dissertation, the student must be the primary author (as judged by the student's *Graduate Advisory Committee*), and the advisor/co-advisor should be one of the corresponding authors. Note that (i) submitted manuscripts, manuscripts in preparation, or manuscripts under review cannot be counted towards the minimum publication requirement and (ii) patents (filed or issued) will not be counted toward fulfilling the minimum publication requirement.

(C.11.) Before scheduling the Ph.D. defense, the student should contact the *Graduate Affairs Committee* (GAC), which will perform their own evaluation to confirm that the student is meeting the minimum requirements for degree completion. GAC will advise the *Chair of the Department* of its evaluation.

(C.12.) The student is obliged to provide a final draft of the dissertation to the *Graduate Advisory Committee* at least two weeks prior to the date of the defense.

(C.13.) Students must satisfy the residency requirements as specified in the *Graduate Catalog*.

(C.14.) Failure to comply with the deadlines above will result in loss of Ph.D. status and departmental support. Reinstatement can be made only by written petition of the student and a positive vote of the departmental *Graduate Faculty*.

V. LIMITATIONS ON GRADUATE TEACHING ASSISTANT (GTA) or GRADUATE ASSISTANT (GA) POSITIONS

(A.) Priority for departmental financial assistance will be given in the order of Ph.D., Master's with Thesis, and Master's without Thesis. Departmental support may be withdrawn if a student switches from a Ph.D. degree to a Master's degree.

(B.) Graduate Teaching Assistant (GTA) support for a graduate student if offered, in the Ph.D. program is limited to 5 years (including any GTA appointments while working on a prior M.S. degree at Missouri S&T). GTA support for a graduate student in the M.S. program if offered, is limited to 3 years.

(C.) All graduate students must pass the *Instructional Communications Workshop* (GTA Workshop) to qualify as a Graduate Teaching Assistant.