Missouri S&T

Linda & Bipin Doshi Department of Chemical and Biochemical Engineering

Graduate Student Handbook

2025-2026

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I. DEPARTMENT OVERVIEW

1. Department Vision Statement

A leading program recognized for sustained excellence in education, research, and innovation with strong global engagement in chemical engineering

2. Department Mission Statement

The Doshi Department of Chemical and Biochemical Engineering will prepare chemical, biochemical, biomedical, and bio engineers for successful careers as leaders and innovators in their field while:

- expanding the engineering knowledge base through experiential learning and scholarly pursuits;
- developing technology to serve societal needs;
- and benefitting the public welfare through service to the profession.

3. Department Educational Objectives

Within five years of graduation, our students will become successful in their chosen career path by:

- making a positive impact as an individual contributor or leader in their career and community;
- working collaboratively to improve the economic and societal environment; and
- expanding career skills through life-long learning.

4. Graduate Program Student Learning Outcomes (GLOs)

Upon graduation our students will exhibit the following:

Ph.D. in Chemical Engineering

- An ability to apply knowledge of chemical engineering to identify, formulate, and solve problems
- An ability to communicate effectively with a range of audiences
- An ability to engage in productive critical thinking so that they may attain a mastery of their specific field of study
- An ability to develop professionally by acquiring and applying new knowledge as needed, using appropriate learning strategies:

Ph.D. in Bioengineering

- An ability to apply knowledge of bioengineering to identify, formulate, and solve problems
- An ability to communicate effectively with a range of audiences
- An ability to engage in productive critical thinking so that they may attain a mastery of their specific field of study

- An ability to develop professionally by acquiring and applying new knowledge as needed, using appropriate learning strategies.

M.S. (Thesis and Nonthesis) in Chemical Engineering

- An ability to apply knowledge of chemical engineering and engage in critical thinking to identify, formulate, and solve problems
- An ability to communicate effectively with a range of audiences
- An ability to develop professionally by acquiring and applying new knowledge as needed, using appropriate learning strategies.

Graduate Certificate in Chemical Process Engineering

- An ability to apply knowledge of chemical engineering processes to their specific field of study
- An ability to communicate effectively with a range of audiences.

Graduate Certificate in Carbon Management Engineering

- An ability to apply knowledge of current carbon management technologies to their specific field of study
- An ability to communicate effectively with a range of audiences.

5. Faculty and Staff

Department Chair:

Dr. Ryan Gilbert
ryan.gilbert@mst.edu
(573) 341-4854
110E Bertelsmeyer Hall

The Chair of the ChBE department coordinates and monitors the efforts of the ChBE faculty and enforces graduation requirements that are specific to the department. Most questions and forms are handled by the associate chairs. You should, however, contact the department chair directly when you have concerns, complaints, or even compliments regarding a member of the faculty.

Associate Chair for Academic Affairs:

Dr. Christi Luks
luksc@mst.edu
(573) 341-7641
210N Bertelsmeyer Hall

The Associate Chair for Undergraduate Studies of the ChBE department handles all aspects of the department's undergraduate affairs including admissions, assigning teaching assistants (GTAs), managing current curricula, and developing new undergraduate programs. She is the delegate to review and sign on behalf of the department all enrollment and undergraduate forms. The Associate Chair can also sign other documents in the ChBE department chair's absence.

Associate Chair for Research: Dr. Jee-Ching Wang
jcwang@mst.edu
(573) 341-6705
210H Bertelsmeyer Hall

The Associate Chair for Research is also the Graduate Coordinator of the ChBE department who coordinates all aspects of the department's graduate affairs including graduate recruitment, admissions, teaching assistants (GTAs), research assistants (GRAs), curricula; and development of new graduate programs. He is the delegate to review and sign on behalf of the department various graduate forms. He is also the default advisor to all graduate students without research advisors and the department's Graduate Track Pathways (GTP) coordinator.

Faculty:

Full-time Faculty			
Hossein **Abedsoltan**	210L Bertelsmeyer Hall	573-341-6225	hosseinabedsoltan@mst.edu
Muthanna **Al-Dahhan**	210B Bertelsmeyer Hall	573-341-7625	aldahhanm@mst.edu
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Daniel **Forciniti**	210J Bertelsmeyer Hall	573-341-4427	forcinit@mst.edu
Ryan **Gilbert** (Department Chair)	110E Bertelsmeyer Hall	573-341-4854	ryan.gilbert@mst.edu
Douglas K. **Ludlow**	210S Bertelsmeyer Hall	573-341-4557	dludlow@mst.edu
Christi Patton-**Luks**	210N Bertelsmeyer Hall	573-341-7641	luksc@mst.edu
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Jee-Ching **Wang**	210H Bertelsmeyer Hall	573-341-6705	jcwang@mst.edu
Mostafa **Yazdi**	110D Bertelsmeyer Hall	573-341-4213	myazdi@mst.edu

Adjunct Faculty			
Baojun **Bai**	303 McNutt Hall	573-341-4016	baib@mst.edu
Anthony **Convertine**	225 McNutt Hall	573-341-4458	convertinea@mst.edu
Fateme **Fayyazbakhsh**	233C Toomey Hall	573-341-4105	f.fba@mst.edu
Yue-wern **Huang** (CASE Associate Dean for Research)	118 Fulton Hall	573-341-4687	huangy@mst.edu
Chang-Soo **Kim**	218 Emerson Hall	573-341-4529	ckim@mst.edu
Hongyan **Ma**	323 Butler-Carlton Hall	573-341-6250	mahon@mst.edu
Shelley **Menteer** (Director of Kummer Institute Center for Resource Sustainability)	228 Schrenk Hall	573-341-4433	shelley.minteer@mst.edu
James **Sterling** (Vice Provost and Dean of Kummer College)	227 Engineering Management	573-341-4613	jsterling@mst.edu
David **Westenberg**	202 Schrenk Hall	573-341-4798	djwesten@mst.edu

Staff:

Office Support Specialist:

Theresa Brown
theresabrown@mst.edu
(573) 341-4421
110B Bertelsmeyer Hall

Theresa works closely with the Chair and Associate Chairs to manage the office and meeting rooms; assist in processing graduate student forms and meetings; coordinate miscellaneous department events; manage GTA assignments and workshops; assign graduate advisors and office space; process graduate student employment and tuition waivers; and handle one Card expense reports for departmental purchases/travel/ events/seminars.

Office Support Specialist:

Lan Liu
lanliu@mst.edu
(573) 341-4415
110C Bertelsmeyer Hall

Lan works closely with the Chair and Associate Chairs to manage the office; order office supplies and teaching lab supplies; handle visitor travel arrangements/ reimbursements; assist the purchasing of the department equipment, shipping, and receiving; process undergraduate student employment ePAFs; and assist with ABET, Industrial Advisory Committee, Academy of Chemical Engineers, phone-a-thon, Jackling Summer camp, and departmental scholarships.

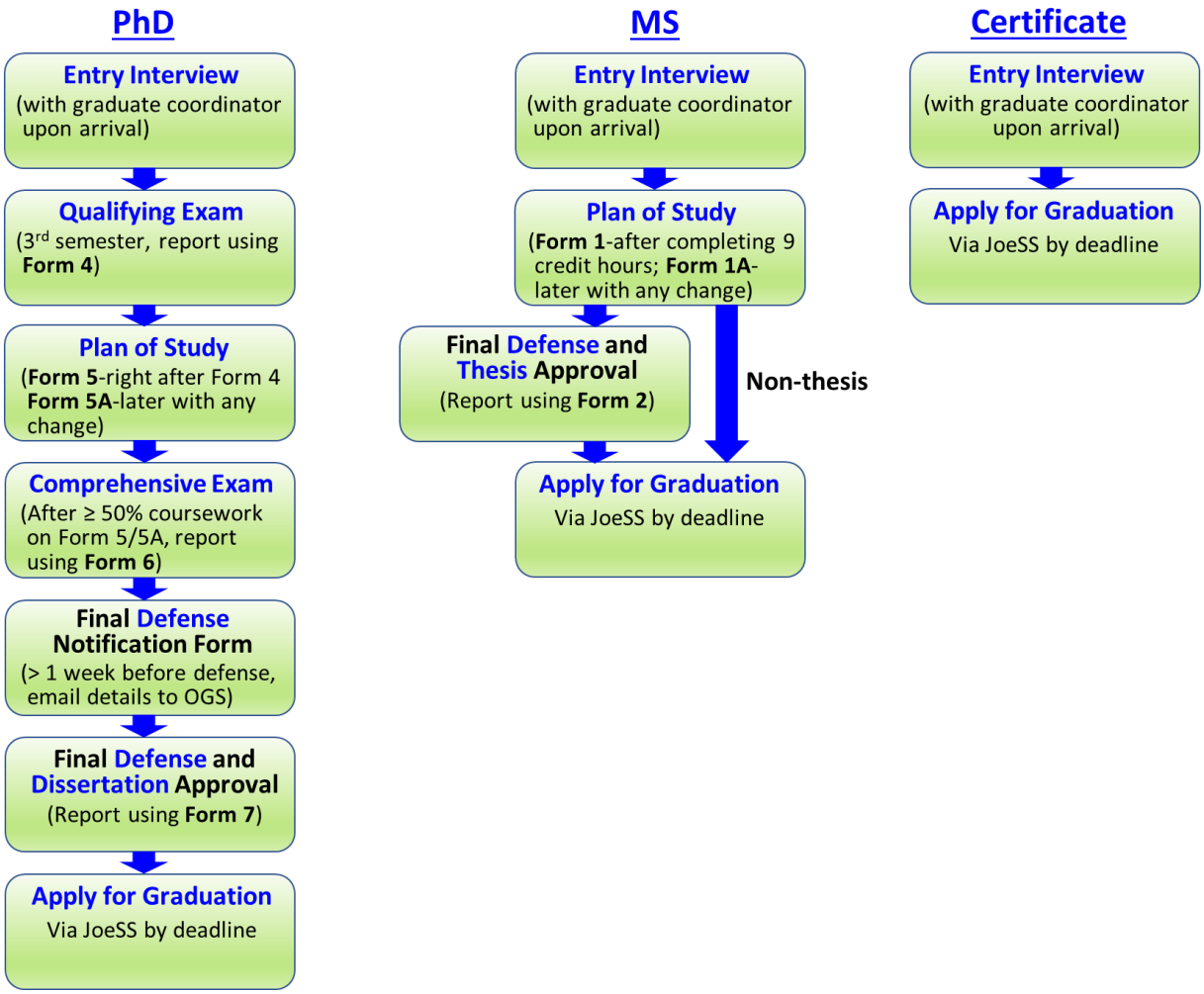
Research Engineering Technician: Micheal Murphy
murphyml@mst.edu
(573) 341-4108
B16 Bertelsmeyer Hall

The technician works with our research and teaching laboratories to keep our equipment operating and to update our facilities. If you notice anything in the building that is broken or needs repair, please report it to the main office.

II. STEPS TO COMPLETE GRADUATE DEGREE

1. Milestones and Forms

The campus policies and rules concenring ALL graduate programs can be found in the graduate catalog: https://catalog.mst.edu/graduate/. The important miletones and their graduate forms and due times are summarized below. The ChBE departmental policies and rules were established and revised by the ChBE faculty required to be compliant with those by the campus.



2. Graduate Form Submission

Students can have different degree plans individualized to suit their backgrounds and interests. To ensure proper progress and satisfaction of degree requirements, the **degree plans and changes need to be reported to and approved by the campus (Office of Graduate Education) via graduate forms**. To this end, the department is an intermediate step to help review degree plans and changes. Please visit your graduate advisor in and/or the website of the Office of Graduate Education, graduate catalog, and Sections IX-XI of this Handbook for more relevant information.

All graduate forms must be submitted electronically by students from this website: https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/forms/. To submit a graduate form, click on the right form to start. The first page usually asks for your name, email address, student number, degree information, and your advisor's name and email address. Form 1 for thesis M.S. students and Form 5 for Ph.D. students also need the names and email addresses of your thesis/dissertation committee members. Click the "Next" button at the bottom to proceed to the next page.

After submitting a form, you (requestor) will receive an email from "S&T Graduate Forms Workflow" that (i) confirms the request been sent to the first recipient, (ii) shows a summary of the responses (found in the body of the email and the pdf attached) entered to the Google form, (iii) provides a Request #X link at top that can be used to check the status of the workflow (who has signed or yet to sign) at any time, and (iv) includes a link for uploading/re-uploading corrected files. Once approved by the Office of Graduate Education, a notification email will be sent to you. It is important to keep the email and all its attached forms for future references, particularly the course plan attached to Form 1 (MS) or Form 5 (Ph.D.).

3. Graduation Deadlines and Checklists

Information and other frequently asked questions (e.g., commencement, regalia, etc.) about graduation can be found on the website below:
https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/graduation/.

To ensure timely graduation without complications, students need to

(i) **Check degree audit:** preferably at the end of every semester and **at the beginning of your last semester**. Log into https://mydegree.mst.edu to generate your own degree audit that lists all your active degree options, graduate forms filed or due, courses completed or registered, and degree requirements fulfilled or not. **Degree audit is also what the campus uses to determine if you are ready to graduate**. Degree audit in the "2UP" format (shown below) is very convenient as it summarizes everything into one age with two columns where each section between two dashed lines represents a requirement that is either fulfilled (denoted by OK) or not (denoted by NO). The last section is "COURSES NOT USED TOWARD GRADUATE DEGREE". Any course listed there was taken but not used to fulfil degree requirements because it was either not accepted or not included in the latest approved Form 1 or Form 5. If you want to move these courses to be counted, submit Form 1 or Form 5 using the same procedure.

```
-------------------------------------------------------------------|
INSTITUTION / PRIOR DEGREE         FIELD OF STUDY            DATE|
-------------------------------    ------------------------------|
Foreign Institution                                       01-2021|
  Bachelor of Engineering           Chemical Engineering          |
MISSOURI S&T                                              12/2022|
 Chemical Engineering MS            Non Thesis                    |
===================================================================
-------------------------------------------------------------------|
 ******* ALL REQUIREMENTS IDENTIFIED BELOW HAVE BEEN MET ******* |
-------------------------------------------------------------------|
OK  1  A GRADUATE FORM 1 MUST BE SUBMITTED DURING THE SEMESTER    |
       IN WHICH THE STUDENT COMPLETES 9 HOURS OF GRADUATE CREDIT |
    EARNED:   0.0 HOURS               1 SUB-GROUP                |
-------------------------------------------------------------------|
OK  2  CUMULATIVE GRADUATE CREDIT TAKEN AT BOTH GRADUATE AND      |
       UNDERGRADUATE LEVELS (MUST HAVE 3.0 GPA)                   |
    EARNED:  33.0 HOURS               1 SUB-GROUP     3.000 GPA  |
      SP21 CHEM ENG5110  3.0 B      SP21 CHEM ENG5150  3.0 A     |
      SP21 CHEM ENG5190  3.0 B      SP21 CHEM ENG6015  1.0 A   >R|
      FS21 CHEM ENG5100  3.0 C      FS21 CHEM ENG5220  3.0 C     |
      FS21 CHEM ENG6015  1.0 A   >R FS21 CHEM ENG6180  3.0 B     |
      SP22 CHEM ENG6241  3.0 B      SP22 ENG MGT 6611  3.0 B     |
      SP22 ENV ENG 5642  3.0 B      FS22 CHEM ENG6015  1.0 A   >R|
      FS22 ENG MGT 5710  3.0 B                                   |
-------------------------------------------------------------------|
OKOPT  GRADUATE CREDIT FROM POST-BAC AND DUAL STATUS - (INFORMA-  |
       TIONAL ONLY)                                               |
    EARNED:   0.0 HOURS               1 SUB-GROUP                |
-------------------------------------------------------------------|
OKOPT  UNDERGRADUATE CREDIT RECEIVED AS A GRADUATE STUDENT (IN-   |
       FORMATIONAL ONLY)                                          |
    EARNED:   0.0 HOURS               1 SUB-GROUP                |
-------------------------------------------------------------------|
OK  3  GRADUATE DEGREE WITH NON THESIS                            |
       30 CREDIT HOURS MINIMUM                                    |
    EARNED:  33.0 HOURS               2 SUB-GROUPS    3.000 GPA  |
      SP21 CHEM ENG5110  3.0 B      Int Reactor Design           |
      SP21 CHEM ENG5150  3.0 A      Int Process Computing        |
      SP21 CHEM ENG5190  3.0 B      Plantwide Process Cntrol     |
      SP21 CHEM ENG6015  1.0 A   >R Lecture Series               |
      FS21 CHEM ENG5100  3.0 C      Intrmed Transport Phenom     |
      FS21 CHEM ENG5220  3.0 C      Intermediate Thermo          |
      FS21 CHEM ENG6015  1.0 A   >R Lecture Series               |
      FS21 CHEM ENG6180  3.0 B      Advanced CFD Application     |
      SP22 CHEM ENG6241  3.0 B      Int Chem Process Safety      |
      SP22 ENG MGT 6611  3.0 B      Lean Systems                 |
      SP22 ENV ENG 5642  3.0 B      Sustainability               |
      FS22 CHEM ENG6015  1.0 A   >R Lecture Series               |
      FS22 ENG MGT 5710  3.0 B      Six Sigma                    |
-------------------------------------------------------------------|
OK  4  COURSES NOT USED TOWARD GRADUATE DEGREE                    |
    EARNED:   0.0 HOURS               1 SUB-GROUP                |
-------------------------------------------------------------------|
                                                                   |
FS22 - 4 CR HRS - Reduced Enrollment form signed 08/19/22          |
-------------------------------------------------------------------|
```

(ii) **Apply to graduate:** Complete and submit application for graduation form in Joe'SS within the first four weeks of the semester/session you plan to graduate. The university will review your forms and course records to notify you of your deficiencies or readiness to graduate. You will not graduate if this process is not initiated by your application.

(iii) **Deadlines:** Non-thesis M.S. and graduate certificate students need to submit their last course plan/form usually 1.5 months before the end of a semester. Thesis M.S. and Ph.D. students have more deadlines for defense, format check, and thesis/dissertation submission.

(iv) **Graduation checklists:** When you are close to graduation, it is highly recommended to download and utilize a graduate checklist to ensure a seamless graduation experience.

4. Registration Holds (check JoeSS account regularly to find out)

Every semester graduate students may face the following holds placed by the campus:

(i) **Advising hold:** can be removed by academic advisor after preregistration advising, in person or via email, to discuss courses to take for next semester.

(ii) **Graduate action hold:** placed and removed by the Office of Graduate Education

when certain graduate form is due, for example, M.S. Form 1 or Ph.D. Form 5

(iii) **Administrative hold:** placed and removed by the Registrar due to academic records such as transcripts, diploma, etc.

(iv) **Financial hold:** placed and removed by Cashier due to outstanding balance.

(v) **Immunization hold:** placed and removed by Student Health.

III. REQUIRED GRADUATE COURSES

In brief, the university's graduate degree requirements are only about minimum numbers of credit hours in different categories while different departments specify what courses are acceptable for different categories and different graduate degrees. The ChBE faculty has established the following categories and courses:

1. Chemical Engineering M.S. Level Core Courses

- Chem Eng 5100 Intermediate Transport Phenomena (LEC 3.0)
- Chem Eng 5110 Intermediate Chemical Reactor Design (LEC 3.0)
- Chem Eng 5220 Intermediate Engineering Thermodynamics (LEC 3.0)

* Chem Eng 5150 Intermediate Process Computing (LEC 3.0, non-thesis M.S. only)

2. Chemical Engineering Ph.D. Level Core Courses

- Chem Eng 6100 Advanced Chemical Engineering Thermodynamics (LEC 3.0)
- Chem Eng 6110 Advanced Transport Phenomena (LEC 3.0)

3. Bioengineering Ph.D. Level Core Courses (minimum of 9 credit hours)

- BME 5100 Drug and Gene Delivery (LEC 3.0)
- BME 6400 Biomanufacturing (LEC 3.0)
- BME 6500 Pharmaceutical Process Engineering (LEC 3.0)
- Chem Eng 5250 Isolation and Purification of Biologicals (LEC 3.0)
- MS&E 5310 Biomaterials I (LEC 3.0)

4. BME 5311 Integrity and Ethics in Bioengineering (LEC 1.0): required for all Bioengineering Ph.D. students but elective for others.

5. Chem Eng 6015 Lecture Series (built around Graduate Seminars)

1) Required for thesis M.S. and Ph.D. students in semesters when they are enrolled in 6099 Research. At least two Chem Eng 6015 enrollments are required for Bioengineering Ph.D. students and three required Chem. Eng. Ph.D. students.
2) Three (or more) credit hours of Chem Eng 6015 can be used as equivalent to a 3-credit-hour 6000-level lecture course in a graduate student's Form 1 or Form 5.
3) Letter grades will be assigned to enrolled students by the faculty member in charge based on the students' attendance and final report. Usually missing two seminars

in a semester is enough to be downgraded to B, three to C, and any more would lead to an F. Students are allowed to make up missed seminars by attending related seminars in other departments. Please consult with the faculty member in charge of ChE 6015 for such requirements and for grading policies.

6. Bridge courses

Bridge courses at 3000 level can be included in a graduate student's Plan of Study (Form 1 for M.S. and Form 5 for Ph. D.) up to 6 credit hours. For more detail, please consult graduate catalog for different credit hour requirements.

1) **Chemical engineering graduate students** from non-ChE backgrounds

The following "bridge" courses have been established by the faculty to help them get properly prepared before taking the required graduate courses.

- Chem Eng 3101 Fundamentals of Transport in Chemical and Biochemical Engineering → Chem Eng 5100
- Chem Eng 3120 Chemical Engineering Thermodynamics → Chem Eng 5220
- Chem Eng 3150 Chemical Engineering Reactor Design → Chem Eng 5110

During graduate orientation and/or entry interview, the graduate coordinator will review a student's degree background, previous courses, and graduate study plan and discuss with the student to select the most sensible bridge courses for the student. When needed, additional bridge courses such as Calculus and Chem Eng 2100 (Material and Energy Balances) may also be recommended or required.

2) **Bioengineering Ph.D. students:**

A course from the required list can be counted as an elective course when it is above the minimum 9 credit hours. Prerequisites for the required courses are recommended and potentially necessary for students from distant backgrounds. They may also be counted for fulfilling degree requirements. Please refer to the Graduate Catalog or consult with the course instructors and graduate coordinator.

IV. Ph.D. COURSE REQUIREMENTS

1. Campus requirements

1) **Ph.D. students entering without a prior master's degree** are required to complete a minimum of 72 hours of graduate credit. Their doctoral plan of study (Form 5/5A) must include **(i) a minimum of 30 credit hours of lecture courses at 4000 level or above** (1000/2000-level courses cannot be included but the bridge courses at 3000 level could be), (ii) a minimum of 12 credit hours from 6000-level lecture courses, and (iii) a minimum of 30 credit hours of graduate research (Chem Eng. 6099) is required. If a student has **co-advisors in different departments, the research credit may be shared by all departments involved**.

2) **Ph.D. students entering with a prior master's degree** acceptable to the department will be given a block of 30 lecture credit hours (plus one year of

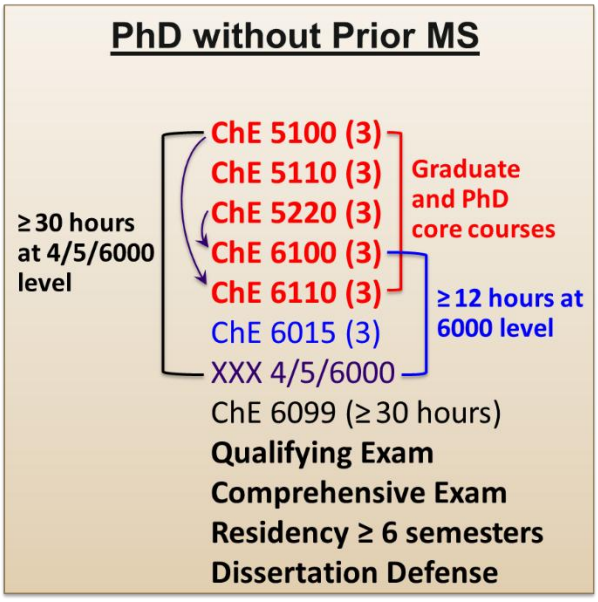
residency) to include first in their doctoral plan of study (Form 5/5A). As a result, they are required to complete a minimum of 42 hours of graduate credit, including **(i) a minimum of 12 hours of graduate lecture courses at 4000 level or above**, and (ii) a minimum of 9 credit hours from 6000-level lecture courses, and (iii) a minimum of 24 credit hours of graduate research (Chem Eng. 6099) is required. If a student has co-advisors in different departments, the research credit may be shared by all departments involved

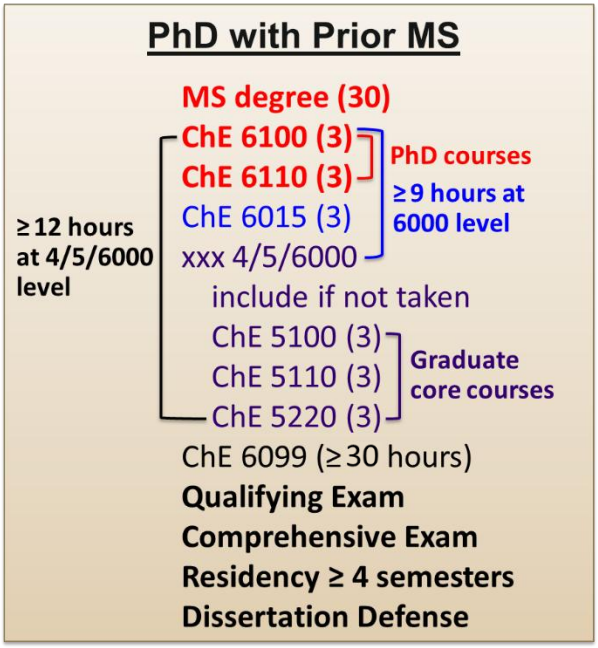
3) **Special purpose courses** such as CHEM ENG 5040 Oral Examination, CHEM ENG 6040 Oral Examination, CHEM ENG 6050 Continuous Registration, and CHEM ENG 6085 Internship will not be accepted as either lecture course or research hours as they are neither. CHEM ENG 5000 Special Problems and CHEM ENG 6000 Special Problems are possible to be counted for lecture credit hours but requires planning and consent of instructor and graduate coordinator.

4) **Residency** at Missouri S&T is defined as sustained intellectual interactions among the student and the academic community. The candidate for a doctoral degree receives 0.5 year of residency from each Spring or Fall semester (NOT summer) enrolled as an on-campus student at Missouri S&T. A minimum of three years of residency is required for Ph.D. degree, which is reduced to two years of residency for Ph.D. students entering with an acceptable prior master's degree.

2. Chemical engineering program requirements

1) **Chemical Engineering Ph.D. students,** with or without a prior master's, must complete (i) the three M.S.-level core courses and the two Ph.D.- level courses stated above and (ii) a minimum of three Chem Eng 6015 enrollments.





2) **Bioengineering Ph.D. students** are quired to fulfill the same lecture and research credit-hour requirements established by the campus, which must include (i) a

minimum of 9 credit hours from the Bioengineering Ph.D.-level core courses, (ii) BME 5311 Integrity and Ethics in Bioengineering, (iii) a minimum of two Chem Eng 6015 enrollments, and (iv) a minimum of 18 credit hours from the list of approved elective courses that can be found in the graduate catalog: (https://catalog.mst.edu/graduate/graduatedegreeprograms/bioengineering/).

3. Individualized course plan

1) **Form 5:** Given sufficient opportunities and flexibilities, every Ph.D. student can have a different, individualized Plan of Study (Form 5) that comprises (i) research plan and (ii) course plan. Form 5 must be submitted by the end of the semester in which a Ph.D. student passes the qualifying examination. It will be reviewed and approved or declined by the department and by the Office of Graduate Education to ensure compliance with the minimum departmental and university requirements.

2) **Course plan:** The Ph.D. course plan must list all completed and current courses as well as those planned for future semesters for the Ph.D. degree. Once approved, the course plan is like the student's "degree contract" with the university for the degree. It is strongly advisable to keep the latest, approved course plan as it is what a student should use to fill out Form 5A and what the department and the Office of Graduate Education will use to review Form 5A. For more detail, please refer to Section IX "Doctoral Forms".

3) **Form 5A:** Any change of (i) either research plan (e.g., project, advisor, or dissertation committee member) or (ii) course plan (e.g., course, credit hour, or semester) must be reported back to the department and the Office of Graduate Education for approval via the same form now called Form 5A, or the "contract updates" will not be accepted. The last section in a degree audit, "COURSES NOT USED TOWARD GRADUATE DEGREE", is there for this reason. If the change is related to the research plan, every dissertation committee member must review and approve it. If the change is related to the course plan, then only the research advisor is needed to review and approve it.

4) **Reduced enrollment:** The individualization of study plan includes the possibility of **1 hour/semester** without Jeopardizing the full-time student status. To qualify for reduced enrollment, a Ph.D. student must pass the comprehensive examination and complete all coursework and residency requirements for the doctoral degree. To apply and to be approved, the student must include subsequent semester(s) with 1.0 hour/semester (usually ChE/BME 6099) in their Form 5A, which may require a new submission. For students that have left campus, the 1 credit hour reduced enrollment should be ChE/BME 6050 and the student must submit a required form available on the following website:

https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/forms/doctoral/

V. M.S. COURSE REQUIREMENTS

1. Campus requirements

1) **Thesis option:** a minimum of 30 hours of graduate credit that must include (i) a minimum of 18 credit hours at 4000-level or above (1000/2000-level courses cannot be included but the bridge courses at 3000 level could be), (ii) a minimum of 6 credit hours from the group of 6000-level lecture courses, and (iii) a minimum of 6 credit hours of Chem Eng 6099 to perform research, write thesis, and defend M.S. thesis. If a student has co-advisors in different departments, the research credit may be shared by all departments involved.

2) **Non-thesis option:** a minimum of 30 hours of graduate credit that must include (i) a minimum of 24 credit hours from Chem Eng courses, including those at 4000/5000/6000 level and up to 6 credit hours of bridge courses, and (ii) a minimum of 9 credit hours from 6000-level lecture courses. **No credit hours of ChE 6099 Research can be counted for non-thesis M.S. degree even for those switching from thesis to non-thesis option**.

   It is very common for Ph.D. students, with or without prior M.S. degree, to use 10 courses to earn a non-thesis M.S. first. This can be done by applying to the non-thesis M.S. program via the same portal: https://connect.mst.edu/apply/. Note that any course appearing on Form 1/1A cannot be used again on Form 5/5A.

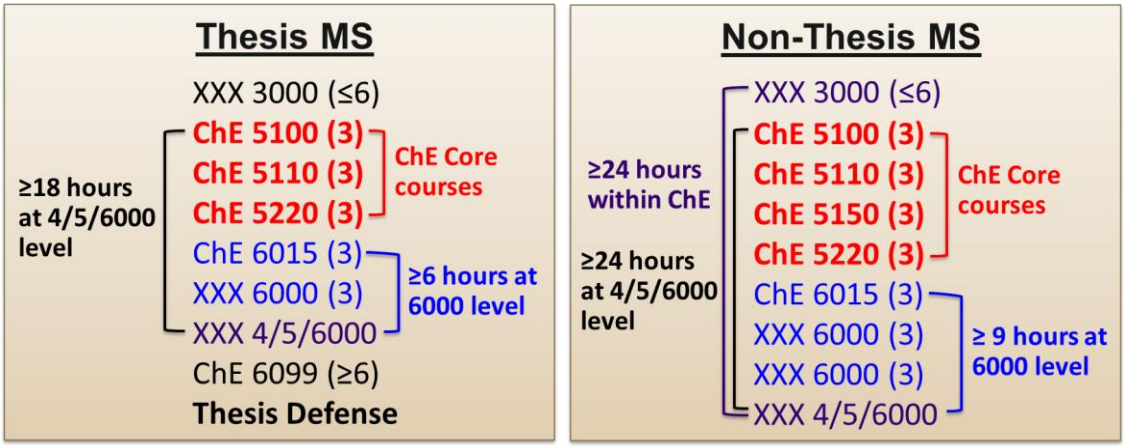
3) **Special purpose courses** such as CHEM ENG 5040 Oral Examination, CHEM ENG 6040 Oral Examination, CHEM ENG 6050 Continuous Registration, and CHEM ENG 6085 Internship will not be accepted as either lecture course or research hours as they are neither. CHEM ENG 5000 Special Problems and CHEM ENG 6000 Special Problems are possible to be counted for lecture credit hours but requires planning and consent of instructor and graduate coordinator.

2. Chemical engineering program requirements

1) **Thesis M.S. students:** must take Chem Eng 5100, Chem Eng 5110, Chem Eng 5220, and 1 credit hour of Chem Eng 6015 in three semesters.

2) **Non-thesis M.S. students:** must take a minimum of 24 credit hours in chemical engineering courses including Chem Eng 5100, Chem Eng 5110, Chem Eng 5220, and Chem Eng 5150 Intermediate Process Computing. No credit hours of ChE 6099 Research can be counted for non-thesis M.S. degree even for those switching from thesis to non-thesis option. The graphs below summarize the required M.S. coursework for easier reference.

3) **Second M.S. Degree:** a student who had earned a master's degree at Missouri S&T or elsewhere in one major can earn a second M.S. degree in another area at Missouri S&T. The second M.S. degree requires a minimum of twenty-four additional hours of graduate credit, including a minimum of eighteen credit hours of 4000-, 5000-, and 6000-level lecture courses and a minimum of six credit hours from 6000-level lecture courses. Additionally, for a second/subsequent master's degree with a thesis, a minimum of six credit hours of graduate research is required.



3. Individualized course plan

1) **Form 1:** Given sufficient opportunities and flexibilities, every M.S. student can have a different, individualized Plan of Study (Form 1) that includes a course plan while thesis M.S. students must also include a research plan. Form 1 must be submitted by the end of the fourth week of the second semester of enrollment in the master's program. It will be reviewed and approved or declined by the department and by the Office of Graduate Education to ensure compliance with the minimum departmental and university requirements.

2) **Course plan:** The M.S. course plan must list all completed and current courses as well as those planned for future semesters for the M.S. degree. Once approved, the course plan is like the student's "degree contract" with the university for the degree. It is strongly advisable to keep the latest, approved course plan as it is what a student should use to fill out Form 1A and what the department and the Office of Graduate Education will use to review Form 1A. For more detail, please refer to Section X "Master Forms"

3) **Form 1A:** Any change of (i) either research plan (e.g., project, advisor, or dissertation committee member) or (ii) course plan (e.g., course, credit hour, or semester) must be reported back to the department and the Office of Graduate Education for approval via the same form now called Form 1A, or the "contract updates" will not be accepted. The last section in a degree audit, "COURSES NOT USED TOWARD GRADUATE DEGREE", is there for this reason. If the change is related to the research plan, every dissertation committee member must review and approve it. If the change is related to the course plan, then only the research advisor is needed to review and approve it.

4) **Reduced enrollment:** International M.S. students who have less than 9 credit hours to take in their exit semester are allowed to request reduced enrollment but currently required to take at least 3 credit hours. For such reduced enrollment requests, please contact the Office of International Student and Scholar Services (ISSS) at ISSS@mst.edu, (573) 341-4208, and https://international.mst.edu/. For all M.S. students on a GRA/GTA/GA appointment, they also need to fill out and submit the "Request for Waiver of Enrollment Requirements" form available here:

https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/forms/masters/

VI. GRADUATE CERTIFICATE COURSE REQUIREMENTS

The department currently has two graduate certificates which are briefly summarized below. For more information, please consult with the graduate coordinator or refer to the graduate catalog (https://catalog.mst.edu/graduate/graduatecertificates/). M.S. or Ph.D. courses can be used to earn graduate certificate(s) but this needs to be done by application and BEFORE completing the M.S. or Ph.D. degree.

1. **Chemical Process Engineering:** This certificate requires two core courses selected from Chem Eng 5100, Chem Eng 5110, Chem Eng 5150, or Chem Eng 5220, and two 3-credit hour Chem Eng lecture courses at 5000 or 6000 level.
2. **Carbon Management Engineering:** This certificate requires two core courses in Chem Eng 5325 Carbon Capture Process Engineering and Petro Eng 5050 Carbon Storage, and two 3-credit hour lecture courses from a list of approved Chem Eng, Mech Eng, and Petro Eng courses.

VII. COURSE TRANSFERABILITY (FORM 1 AND FORM 5)

1. **Share-credit and graduate credit courses by Missouri S&T students**
   1) **Graduate Track Pathways (GTP) share credits:** courses taken by students when completing BS degree at Missouri S&T, up to 6 credit hours of 5000 level courses for M.S. degree and up to 12 credit hours of 5000-6000 level courses for Ph.D degree, may be designated upon the approval of their GTP application.
   2) **Dual Enrollment:** courses taken by students when completing BS degree at Missouri S&T can be reserved for a graduate degree, hence excluded from the BS degree, via dual enrollment application.
2. **Graduate courses from another university:** may be transferrable as long as they (i) have not been used to earn another degree, (ii) were registered as graduate credits when they were taken, and (iii) received at least a B grade or equivalent. The university rules concerning transfer courses only specify the maximum numbers of credit hours for different degrees as summarized below, but whether the courses are qualified for transfer and what are the equivalent courses at Missouri S&T, required or elective at 5000 or 6000 level, should be determined by the departments involved.
   - **Ph.D. students without a master's degree** may transfer a maximum of 18 credit hours
   - **Ph.D. students with a master's degree** may transfer a maximum of 9 credit hours.
   - **M.S. students** may transfer a maximum of 9 credit hours.
   - Graduate Certificates in the chemical engineering graduate program does not accept transfer credit.

After being determined transferrable by the departments offering equivalent courses, the qualified graduate courses are done by listing them individually on Form 1 or Form 5 (Plan of Study) with the MST equivalent courses (course number and title) written in parenthesis within the same box. It is important to note that **a student cannot take the same course again for a new degree even if the course has multiple course numbers**. If a required core course can be transferred or has been taken before, the student should take another course with the approval of the Graduate Coordinator based on educational objectives, research needs, and number of credit hours. Consult the Graduate Coordinator and/or graduate advisor in the Office of Graduate Education (https://grad.mst.edu/) for additional questions.

VIII. GPA AND GRADE REQUIREMENTS FOR GRADUATE STUDENTS

1. In order to earn a graduate degree a student must achieve both a cumulative GPA of 3.0 or higher for all graduate courses listed on the plan of study (Form 1 or Form 5) and cumulative GPA of 3.0 or higher in all coursework taken at Missouri S&T. No substitution may be made on the Plan of Study for courses in which the student has earned less than a B grade.
2. In order to earn a graduate certificate, a student must achieve a cumulative GPA of 3.0 or higher in the courses approved for the certificate. If a graduate certificate student applies and gets admitted to M.S. program, only the courses receiving A or B grades can be counted toward the subsequent M.S. degree.
3. If a 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.
4. 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.

   In addition, the ChBE department maintains an additional GPA requirement for Ph.D. students, which is ≤ 9 credit hours of C grades over the course of Ph.D. study.

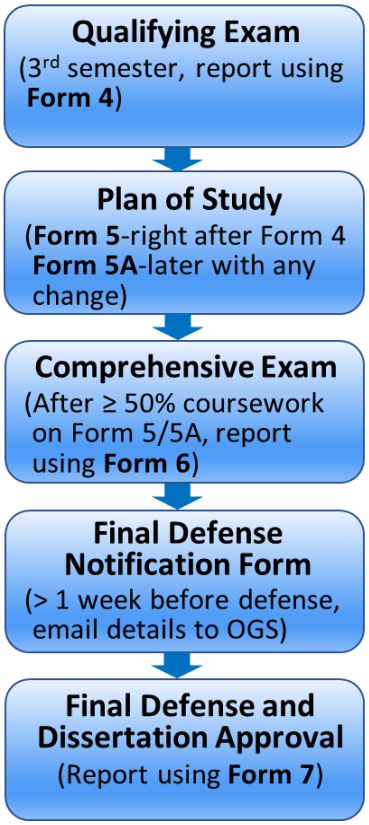
IX. DOCTORAL MILESTONES AND FORMS

The pursuit of a Ph.D. degree requires a student to complete several milestones and submit corresponding doctoral forms. The forms must be submitted online here: (https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/forms/doctoral/) where instructions are also available. Below are some relevant explanations and details.

1. Form 4 and Qualifying Examination (3rd semester)

The goal of the qualifying exam is to examine the critical thinking and analysis capabilities of new Ph.D. students. **A Ph.D. student should take it before the end of their 3rd semester** and will have two chances to pass the qualifying exam. The outcome of each attempt will be reported by the Graduate Coordinator to the Office of

Graduate Studies using Form 4. **If the student fails both times, the university rule disqualifies the student to continue their Ph.D. study in the department.** Those who enter the Ph.D. program in the Summer will be considered together with those entering in the Fall semester.



Between the qualifying exam committee, graduate committee, and research advisor, a pool of papers will be gathered, of which one will be selected and given to the student for qualifying exam. Once informed, the student will have at least a month to critically review the paper and relevant literature to develop an exam manuscript centered around the selected paper. This manuscript may have a potential to be expanded into the first chapter of the student's Ph.D. dissertation and a publishable review paper.

1) The qualifying exam manuscript should be at least 7 pages long but not more than 10 pages in length including written narrative, tables and figures (12 point, Times New Roman, single spaced with 1" margins) with sufficient references to indicate familiarity with the research topic (reference list and title page not included in the page limit). The manuscript should reflect the student's critical analysis and understanding of the literature related to the chosen research topic. **It is strongly recommended to organize your analysis and manuscript according to the following suggestion**:

   A. **Introduction:** general perspectives of the scope and importance of the research area (e.g., CO_2 management, battery, bioengineering, etc.)
   B. **Background and motivation** of the work discussed in the manuscript: description and discussion of the purposes, methods, results, and findings of your key references, plus their limitations either reported or identified by yourself, that point out directions for ongoing or future research (e.g., what have been done to reduce CO_2 emission, capture and storage CO_2, or utilize/convert CO_2)
   C. **The current state of art** in the selected research area: summary of key research accomplishments to date and known remaining challenges and of desired research outcomes to meet future needs (e.g., latest reactions and processes for CO_2 conversion).
   D. **Areas for future work** in the research area: there should be several worthy of pursuit based on based on sections B and C, including your Ph.D. project (e.g., new reactions or catalysts for CO_2 conversion).
   E. **A proposed theoretical and/or experimental plan** to address a topic from the future work: your Ph.D. project, needed to be explained why it is important and even necessary to work on.

F. A summary and outlook of the selected research topic: the potential contributions of and the likely future situation affected by your Ph.D. project.
G. Potential learning and benefits that address the following questions:
   a) What the candidate learned from the literature that might be helpful towards his/her own research thesis work?
   b) What the candidate might use from their review towards his/her own research thesis topic?
   c) What literature the candidate might apply to their own research, and
   d) Ideas generated during the literature review that might advance the candidate's own research thesis work and/or might be suitable for a future funded proposal.
H. Tables and Figures (with reference if taken from the literature)
I. List of References (ACS journal format)

2) The student will be required to present their qualifying exam manuscript to the exam committee. This oral presentation is expected to be around 30 minutes, hence needing about 30 slides at most. The student should send the exam manuscript and presentation slides to the Graduate Secretary two weeks prior to their scheduled exam date. Although it is not supposed to disrupt regular advising and research activities, the manuscript and presentation should be the student's own work without direct feedback or help from the advisor. They may also be checked for any plagiarism concerns by the department and the exam committee. Serious plagiarism issues will be grounds for not only failing the qualifying exam but also possibly disqualification from the Ph.D. program. An rule of thumb to avoid such issues is to cite references whenever and whereever possible or needed in the manuscript and presentation slides.

3) Following the student's presentation, the exam committee may ask questions related directly to the manuscript and presentation or more generally to the fundamental principles, such as reaction engineering, transport phenomena, and thermodynamics, that are considered relevant to the selected research topic. The student will be required to answer them orally to the exam committee.

4) If the student does not pass the first time, retaking the exam will require the student to go through the entire procedure again. Ideally, the second attempt should be completed by the end of the same semester.

5) Shortcomings identified by the committee from the qualifying exam will be provided in writing and/or verbal explanation to the student and the advisor. The committee may suggest remedial actions for the student to work on independently or with helps and advices from the advisor to address the identified shortcomings.

2. Form 5/5A and Doctoral Plan of Study

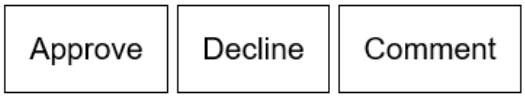
1) **Research plan and dissertation committee:** Before or after the qualifying exam, the student should consult with research advisor to select a title for the research project and to form the Ph.D. dissertation committee. The committee must consist of a minimum of five members with the advisor serving as the committee chair. The advisor and at least three others must be members of the Missouri S&T

graduate faculty. The advisory committee must include at least one member from outside the student's major department. If a committee member is not a member of the Missouri S&T graduate faculty, a vita verifying equivalent level of education must be provided with the Form 5/5-A.

2) **Electronic submission:** After passing qualifying exam, the student must formally plan the remainder of their graduate program in consultation with their academic advisor and selected committee members. The plan of study (Form 5) must include a research plan (project title and names and email addresses of dissertation committee members) and a course plan (Excel spreadsheet). It must be submitted electronically from the following website by the end of the semester in which the student passes the qualifying examination. Students who fail to comply with the deadline to submit the Form 5 will have a registration hold placed on their account by the office of graduate education. Relevant instructions can also be found on the same website:

   https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/forms/doctoral/

   Once a student initiates the submission, the advisor, dissertation committee members when involved, department chair or graduate coordinator will receive an email from "S&T Graduate Forms Workflow" where they will see three options as shown below and click on one to submit their opinions,



   The campus strongly recommends not to cancel a submission to avoid complications. To avoid rejection, it is strongly recommended to eliminate inconsistencies due to format and/or curricular requirements. For this purpose, please discuss with the academic advisor and the gradate coordinator first.

3) **Form 5A for changes of plan of study:** It is very common for Ph.D. students to submit the same form as Form 5A to revise their plans of study.

   - **Committee changes**: no need to upload course plan. An academic advisor and/or committee member being removed or added must approve their removal or addition. The rest of the dissertation committee members and the department chair or graduate coordinator must also approve the Form 5A. A contingency procedure that addresses circumstances when a student seeks to change the makeup of their graduate advisory committee, but a member or advisor is either unable or unwilling to provide the required authorization can be found on the Graduate Education webpage.
   - **Curriculum changes**: **only a revised course plan** to indicate changes of courses, semesters, credit hours, and so on is to be submitted**,** reviewed, and approved by the academic advisor and the department without involving dissertation committee since research is not affected. **The revised course plan should be based on your last approved course plan** and following the demonstrations below. It is thus very important to (i) clean your spreadsheet

(course plan) after it is approved by removing deleted courses and retaining added courses without labels, (ii) **use the cleaned spreadsheet to fill out a revised course plan** according to the demonstration below, and (iii) have the revised course plan reviewed first by the graduate coordinator before submission.

For demonstration, many possible types of course plan changes were compiled into the following example. Please add parentheses to the credit hours of deleted courses (labeled with D) to exclude them from being incorrectly counted in the total number of credit hours.

Doctoral Degree Course Plan

Name and ID: Joe Miner 12345678

Add/ Delete (Form 5A ONLY)	Sem/Yr	Course Prefix/ Course Number	Course Title	Level/Credit Hours and Residency			
				3000- level & non-lec	4000/ 5000/6000- level lec	Research	Residency
	FS/2020	ChemE/5220	Intermediate Engineering Thermodynamics		3.0		0.5
	FS/2020	ChemE/5810	Introduction to Polymeric Materials		3.0		
	FS/2020	ChemE/5001	Catalysis and Reaction Kenetic		3.0		
	SP/2021	ChemE/5110	Intermediate Chemical Reactor Design		3.0		0.5
	SP/2021	ChemE/6110	Advanced Chemical Engineering Thermodynamics		3.0		
	SP/2021	MetE/5525	Scanning Electron Microscopy Lab		1.0		
	SP/2021	ChemE/6099	Research			2.0	
	SS/2021	ChemE/6099	Research			(3.0)	
D	FS/2021	ChemE/5200	Biomaterials I		3.0		0.5
A	FS/2021	ChemE/5100	Intermediate Transport Phenomena		3.0		
	FS/2021	ChemE/6099	Research			6.0	
	SP/2022	ChemE/6100	Advanced Transport Phenomena		3.0		0.5
D	SP/2022	ChemE/5150	Intermediate Process Computing		(3.0)		
D	SP/2022	ChemE/5010	Seminar		(1.0)		
A	SP/2022	ChemE/6015	Lecture Series		1.0		
D	SP/2022	ChemE/6099	Research			(2.0)	
A	SP/2022	ChemE/6099	Research			5.0	
	SS/2022	ChemE/6099	Research			3.0	
	FS/2022	ChemE/6241	Intermediate Chemical Process Safety		3.0		0.5
	FS/2022	ChemE/6015	Lecure Series		1.0		
	FS/2022	ChemE/6099	Research			5.0	
D	SP/2023	ChemE/6120	Applied Mathematics in Chemical Engineering		(3.0)		0.5
	SP/2023	ChemE/6015	Lectue Series		1.0		
D	SP/2023	ChemE/6099	Research			(5.0)	
A	SP/2023	ChemE/6099	Research			8.0	
D	SS/2023	ChemE/6099	Research			(6.0)	
A	SS/2023	ChemE/6099	Research			3.0	
A	FS/2023	MSE/6110	Bonding, Crystallography, and structure-property Relationship		3.0		0.5
D	FS/2023	ChemE/6015	Lecure Series		(1.0)		
D	FS/2023	ChemE/6099	Research			(8.0)	
A	FS/2023	ChemE/6099	Research			6.0	
D	SP/2024	ChemE/6015	Lectue Series		(1.0)		0.5
D	SP/2024	ChemE/6099	Research			(8.0)	
A	SP/2024	ChemE/6099	Research			1.0	

3000-level lecture and non-lecture	0.0
4000/5000/6000-level lecture	31.0
Research	42.0
Total credit hours	73.0
Total residency	4.0

0.5 for each Spring & Fall

Take a different course than previously planned

Did not take the course, so add 3 hours to 6099

wrong course replaced by the right course

Not offered

3 hours to ChE 6099

Correcting previous mistake

No need or interest

Adjusting to make 9 total credit hours

After comprehensive exam and last semester do not need to 9 hours

Double check the numbers here as the various revisions may make the automatically calculated sums not correct. Add completed hours only, excluding those labeled with "D"

3. Form 6 and Doctoral Comprehensive Examination

After a Ph.D. candidate has **completed at least 50% of the coursework** required for the Ph.D. degree as listed on their approved plan of study (Form 5/5-A), the candidate should consult their research advisor and committee members to arrange for the comprehensive examination to demonstrate sufficient knowledge and proper progress about the research project to "advance to candidacy"—that is, to go on and write a Ph.D. dissertation. For this exam, please note that

1) There must be at least 12 weeks between a student's comprehensive exam and dissertation defense (final exam).
2) According to campus policy II-20, the student must be enrolled on the date of the comprehensive exam. Failure to do so may invalidate the exam. Concerning the intersessions between semesters, if the student is enrolled in the previous semester, the enrollment will be automatically extended to cover the intersession so that the **student can conduct comprehensive exam during the intersession** without having to enroll in any course.
3) The current format of Ph.D. comprehensive examination comprises a written report and oral presentation of a research project. The student should submit the written report to the dissertation committee **at least one week before the comprehensive exam**. The report could be considered the first draft of the student's Ph.D. dissertation and the oral presentation should reflect what is presented in the written report. Plagiarism of one's own or other's work is an ethical violation and will be grounds for failing the exam. An important way to avoid such mistakes is to cite references properly in the manuscript and presentation file.
4) To report the outcome of the comprehensive exam, the student should submit **Form 6** via electronic workflow to get decisions by email from advisor, committee members, gradate coordinator, and then the Office of Graduate Education. A candidate will be considered to have passed the examination if all, or all but one, of the dissertation committee members vote that the candidate pass.
5) If the student fails the comprehensive examination, the dissertation committee will recommend additional work or other remedial measures to the candidate. A second comprehensive examination may be scheduled no sooner than twelve weeks after the candidate's first attempt. A student who fails the examination a second time will no longer be eligible to receive a doctoral degree from that program. However, the student is still eligible to pursue a graduate degree from any other graduate degree program willing to accept them

Comprehensive exams are also an opportunity to assess graduate student learning outcomes for the department and for the university. For all these reasons and purposes, **the student/advisor should (i) inform the gradate coordinator or graduate secretary when and where is the comprehensive exam, (ii) bring the graduate learning outcome (GLO) assessment rubric forms to the exam to be used by every dissertation committee member** to assess various learning outcomes of the student's Ph.D. study, and **(iii) report the exam outcome and give the rubric forms back to the department/graduator coordinator**. .

4. Final Defense Notification Template (≥1 week prior to defense)

Ph.D final defense must be scheduled on a date that is at least 12 weeks after passing the comprehensive examination. Additionally, the Ph.D. candidate should submit this form via electronic workflow to notify the university and the public **no later than 1 week prior to the defense date**. Before or around the submission of this form, the Ph.D. candidate should also distribute a copy of Ph.D. dissertation to each advisory committee member. Failure to do so may result in an invalid defense.

The Ph.D. dissertation can be written in different formats (e.g., traditional or publication option) but must be in the most professional manner possible. **Many useful resources on formatting your dissertation and binding your work professionally are available here**: https://grad.mst.edu/studentservices/thesisdissertationguide/. It is strongly recommended to visit this website from the beginning to the final stage of writing your dissertation. If additional help is needed, the campus offers a free program called Thesis & Dissertation Writing Camp on a regular basis. To participate, visit https://grad.mst.edu/currentstudents/thesisanddissertationwritingcamp/. All these online resources are provided and maintained by the Office of Graduate Education.

5. Form 7 and Final Examination (Defense)

Similar to comprehensive exam and Form 6, **the student/advisor should (i) inform the gradate coordinator or secretary when and where is the Ph.D. defense, (ii) bring the GLO assessment rubric forms to the defense to be used by every dissertation committee member** to assess student learning outcomes, and **(iii) report the defense outcome and give the rubric forms back to the department/graduator coordinator**. A candidate will be considered to have **passed the defense if all, or all but one, of the advisory committee members** vote that the candidate passed. Regardless of the outcome, **Form 7 must be submitted by the student via electronic workflow to the campus.** Once this form has been approved by the dissertation committee and the Office of Graduate Education, no other content changes can be made except for changes to the format outlined by the Thesis/Dissertation Specifications.

6. ChBE Departmental Ph.D. Dissertation Award

The department created a Ph.D. dissertation award to recognize and honor Ph.D. students who have accomplished excellent Ph.D. dissertations, and to also encourage all Ph.D. students to actively write or participate in writing papers for their research projects. The departmental Graduate Committee has been given charge and thus established the following instructions to handle this award rigorously and consistently. For those who are interested, please consider

1) **Eligibility:** Ph.D. students in their last semester who have successfully defended their Ph.D. dissertations and produced a minimum of three qualified publications. Since summer has no commencement, Ph.D. students graduating in summer can apply to be considered in the preceding Spring semester.

2) **Qualified publications:** published archival papers, accepted/in-press manuscripts, and filed nonprovisional utility patents, which must also be
   - peer-reviewed,
   - with the Ph.D. applicant being the first author, and
   - included in the student's Ph.D. dissertation.

   Delayed publications due to confidentiality reasons may also qualify with advisor's certification.

3) **Application:** Because the Graduate Committee has no or limited access to the needed information, interested and qualified Ph.D. students should apply by submitting digital(pdf) versions of their dissertations and publications as well as a completed **application form** to the Graduate Coordinator on behalf of the Graduate Committee at least one week prior to the commencement.

4) **Awardee:** every applicant who has met the above qualifications, completed their application in time, and received a majority vote from the Graduate Committee will be awarded.

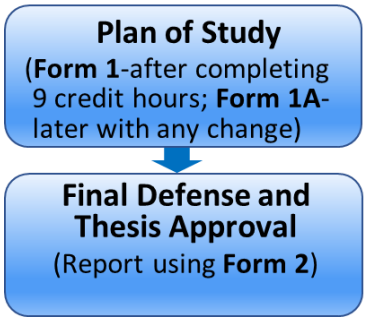
7. Application to Conduct Off-Campus Research

This form must be submitted to request prior approval to conduct off-campus research to ensure that such an endeavor will result in educational experiences which are equivalent, or superior, to those that a student might expect to have at Missouri S&T.

X. MASTER FORMS

The following are graduate forms required or potentially needed for M.S. students to complete their M.S. study. They must be submitted via electronic workflow (https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/forms/masters/).

1. Form 1/1A and Master Plan of Study



Form 1 must be submitted by the end of the fourth week of the second semester of enrollment in the master's program. For other relevant details, please refer to section V.3 of this graduate handbook.

1) **Thesis M.S. research plan and committee:** For students pursuing thesis MS, the thesis committee will be designated on Form 1. The committee must consist of a minimum of three members. The academic advisor will serve as the chairperson of the thesis advisory committee. The advisor and at least half of the other committee members must be members of Missouri S&T graduate faculty. If a committee member is not a member of the Missouri S&T graduate faculty, a vita verifying equivalent level (or higher) of education must be provided with the Form 1/1-A.

2) **Course plan**: required for both thesis and non-thesis M.S. students. The course plan spreadsheet is downloadable from the electronic submission website:

https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/forms/masters/

and filled with courses that have been completed or planned to be taken in future semesters to meet the aforementioned campus and departmental credit-hour requirements. M.S. students very often need to revise plan of study (please keep your latest approved version) and submit the same form as Form 1A to report to the campus. An example of thesis M.S. course plan and another example of bib-thesis M.S. course plan are attached below.

Thesis **Master's Degree Course Plan**								
Name and ID:								
Add/Delete (Form 1A ONLY)	**Sem/Yr**	**Course Prefix/ Course Number**	**Course Title**	**Level/Credit Hours**				
				Transfer	3000- level & non-lec	4000/ 5000-level lec	6000-level lec	Research
	FS 2021	Chem Eng 5100	Intermediate Transport Phenomena			3.0		
	FS 2021	Chem Eng 5220	Intemediate Engineering Thermodynamics			3.0		
	FS 2021	Chem Eng 6099	Research					2.0
	FS 2021	Chem Eng 6015	Lecture Series				1.0	
	SP 2022	Chem Eng 5110	Intermediate Chemical Reactor Design			3.0		
	SP 2022	Chem Eng 5150	Intermediate Process Computing			3.0		
	SP 2022	Chem Eng 6099	Research					2.0
	SP 2022	Chem Eng 6015	Lecture Series				1.0	
	FS 2022	Chem Eng 6180	Advanced Applications of Computational Fluid Dynamics				3.0	
	FS 2022	Chem Eng 6099	Research					5.0
	FS 2022	Chem Eng 6015	Lecture Series				1.0	
	SP 2023	Chem Eng 6099	Research					3.0
Total credit hours:								**30.0**

3) **Form 1A for changes of plan of study:** It is very common for M.S. students to submit the same form as Form 1A to revise their plans of study.

- **Committee changes**: no need to upload course plan. An academic advisor and/or committee member being removed or added must approve their removal or addition. The rest of thesis committee members and department chair or graduate coordinator must approve the Form 1A as well. A contingency procedure that addresses circumstances when a student seeks to change the makeup of their graduate advisory committee, but a member or advisor is either unable or unwilling to provide the required authorization can be found on the Graduate Education webpage.
- **Curriculum changes and non-thesis M.S. students: only a revised course plan to indicate** changes of courses, semesters, credit hours, and so on is to

be submitted, reviewed, and approved by the academic advisor and the department without involving thesis committee since no research is affected. **The revised course plan should be based on your last approved course plan** and following the demonstrations below. It is thus very important to (i) clean your spreadsheet (course plan) after it is approved by removing deleted courses and retaining added courses without labels, (ii) **use the cleaned spreadsheet to fill out a revised course plan** according to the demonstration below, and (iii) have the revised course plan reviewed first by the graduate coordinator before submission. Please add parentheses to the credit hours of deleted courses (labeled with D) to exclude them from being incorrectly counted in the total number of credit hours.

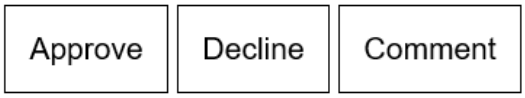
- **Switching between thesis and non-thesis M.S.** study is also done using Form 1/1A by checking a different box during a new submission and uploading a revised course plan. The approval steps are the same including advisor, thesis committee member, department/graduate coordinator, and Office of Graduate Education.

Non-thesis **Master's Degree Course Plan**								
Name and ID:	**Joe Miner 12345678**							
Add/Delete (Form 1A ONLY)	**Sem/Yr**	**Course Prefix/ Course Number**	**Course Title**	**Level/Credit Hours**				
				Transfer	3000- level & non-lec	4000/ 5000- level lec	6000-level lec	Research
	FS22	CHEM ENG 5100	Intermediate Transport Phenomena			3.0		
	FS22	CHEM ENG 5220	Intermediate Engineering Thermodynamics			3.0		
	FS22	CHEM ENG 5810	Introduction to Polymeric Materials			3.0		
	SP23	CHEM ENG 5001	Introduction to colloid checmistry and interfacial enginerring			3.0		
	SP23	MS&E 6060	Chemistry of construction materails				3.0	
D	SP23	CHEM ENG 6110	Advanced Transport Phenomena				(3.0)	
A	SP23	CHEM ENG 6110	Advanced Chemical Engineering Thermodynamics				3.0	
	FS23	CHEM ENG 5150	Intermediate Process Computing			3.0		
	FS23	CHEM ENG 5305	Hazardous Materials Management			3.0		
	FS23	CHEM ENG 6180	Advanced Applications of Computational Fluid Dynamics				3.0	
	SP24	CHEM ENG 5110	Intermediate Chemical Reactor Design			3.0		
							Total credit hours:	30.0

4) **Electronic submission:** Form 1 must be submitted from the following website:

https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/forms/masters/

When initiating the submission, the student can choose different options to indicate their status or purpose of submission. Those in the approval chain, including advisor, (thesis committee members), and department chair or graduate coordinator will receive an email from "S&T Graduate Forms Workflow" where they will see three options as shown below and click on one to submit their opinions,



The campus strongly recommends not to cancel a submission to avoid complications. To avoid rejection, it is strongly recommended to eliminate inconsistencies due to format and/or curricular requirements. For this purpose, please discuss with the academic advisor and the gradate coordinator first.

2. Form 2 and Final Examination (Defense)

When ready, a thesis M.S. student can consult with advisor and thesis committee members to arrange a date for defense. The candidate should distribute a copy of M.S. thesis to each committee member **at least seven days prior to the defense date**. **The student/advisor should (i) inform the gradate coordinator or secretary when and where is the M.S. defense, (ii) bring the assessment rubric forms attached in the appendix to the defense to be used by every dissertation committee member** to assess student learning outcomes, and **(iii) report the defense outcome and give the rubric forms back to the department/graduator coordinator**.

A candidate will be considered to have **passed the M.S. defense if all, or all but one, of the advisory committee members** vote that the candidate passed. Regardless of the outcome, **Form 2 must be submitted by the student via electronic workflow to the campus.** Once this form has been approved by the dissertation committee and the Office of Graduate Education, no other content changes can be made except for changes to the format outlined by the Thesis/Dissertation Specifications.

When writing your M.S. thesis, you want to ensure your document is presented in the most professional manner possible. For this purpose, the following website: https://grad.mst.edu/studentservices/thesisdissertationguide/ **provides many useful resources on formatting your document properly (traditional format or publication option), binding your work professionally, and more**. You are strongly recommended to visit this website from the beginning to the final stage of writing your dissertation. If additional help is needed, the campus offers a free program called Thesis & Dissertation Writing Camp on a regular basis. To participate, visit https://grad.mst.edu/currentstudents/thesisanddissertationwritingcamp/. All these online resources are provided and maintained by the Office of Graduate Education.

3. Request for Waiver of Enrollment Requirements

Graduate instructors, graduate fellows, and GTAs/GRAs are required to be enrolled full time each semester when they receive assistantship. However, M.S. students are allowed one time in their last semester to take less than the minimum full-time load. For this purpose, a M.S. student should submit this form from the same website: (https://grad.mst.edu/studentservices/navigatingyourdegreeprogram/forms/masters/) and also needs to submit Form 1A if reduced enrollment was not part of their previously approved course plan.

XI. GRADUATE CERTIFICATE FORMS

Graduate Certificates are open to existing M.S. and Ph.D. students who can apply via the same application portal: https://connect.mst.edu/apply/. If planned properly, the student can earn a graduate certificate or two without having to take any additional course as certificate courses are allowed to be used again for Form 1/1A or Form 5/5A. However, the student must complete the certificate program before their graduate degree is awarded, otherwise those courses become "locked in" to that graduate degree and cannot be used toward the certificate.

Once a student is active in a certificate program, the relevant courses completed by the student will automatically be pulled into the appropriate sections of their degree audit. The student will only need to apply for completion/graduation via Joe'SS when finishing the last course and no additional form will be needed.

There are two special circumstances that may need the following forms for calrification.

1. **Substitution for Required Certificate Course(s) Form**

   When a required course for a graduate certificate is no longer available or has been taken for a previous degree, this form can be submitted to substitute the required certificate course with an acceptable alternate course.

2. **Certificate Program Courses Form**

   When a certificate student is active in more than one certificate program, this form is required to designate courses for each certificate. Courses taken for a specific certificate cannot be counted toward an additional certificate (no "double-dipping"). This form must be submitted before a second and/or subsequent certificate(s) can be awarded.

XII. GOOD STANDING

1. **University rules and regulations concerning graduate studies** are inflexible but can be updated on an annual basis. They are stated in the Missouri S&T graduate catalog (http://catalog.mst.edu/graduate/) which is updated and published by the Office of Graduate Education (https://grad.mst.edu). The applicability of the rules, regulations, and their changes is determined by the student's catalog year based on the date of admission to the degree program. Students may request to **change to a future catalog year** via electronic workflow. If a student changes their catalog year, they are responsible for fulfilling all of the graduation requirements in the newly chosen

catalog and are not permitted to use a combination of catalogs to satisfy degree requirement.

2. Once admitted to a degree program, on campus graduate students must remain continuously enrolled in each fall and spring semester while summer enrollment is not required except when campus resources are used. A graduate student will be given a specified amount of time (three years for certificate, six years for master's, eight years for doctoral) to complete the program. A student may take a leave of absence, up to one year only, which will not count toward the specified time limit. For this purpose, **Request for Leave of Absence Form** must be submitted via electronic workflow by the student in a timely manner.
3. Graduate students can visit https://registrar.mst.edu/psinfo/degreeaudit/index.html any time to check on their **degree audit**, catalog year, and academic progress towards their degree, including required graduate forms that have been submitted or not. All categories of requirements will have to show 'OK' for graduation.
4. **Academic probation:** "if a 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." A formal notice/letter will be emailed to the student and the department from the Office of Graduate Education.
5. **Full-time enrollment: ≥ 9 credit hours in fall or spring semester and ≥ 3 credit hours in summer session.** Note that **full-time enrollment is required for tuition waiver for sponsored students.** Graduate teaching and research assistants (GTA/GRA), graduate instructors, and graduate fellow are required to be enrolled full time in each semester and summer session when they receive the assistantship except (i) M.S. students in their exit/last semester and (ii) Ph.D. students completing comprehensive examination and minimum requirements of credit hours and coursework. **Reduced enrollment** allows students to retain full-time status while taking less than 9 credit hours for a semester. However, it is not automatic but must be applied for and approved by the Office of Graduate Education. Please refer to the previous sessions about doctoral and mater forms for relevant details.
6. **International students**, with or without assistantship, are required to enroll in a minimum of 9 credit hours in each fall and spring semester. Summer enrollment is optional but a minimum of 3 hours becomes required when a graduate student receives summer assistantship. International students are further subject to US government rules and regulations, including I-20, student visa, OPT, and CPT, which are handled by the Office of International Affairs (https://international.mst.edu/) and the Office of Graduate Education (https://grad.mst.edu/). Please consult with the advisors in these offices for more information and possible changes/ extensions/exceptions in these regards.
7. Those who have been admitted conditionally without satisfactory English proficiency must meet the campus minimum standard within the first year of their graduate study: TOEFL ≥ 79, IELTS ≥ 6.5, Duolingo ≥ 105, or PTE ≥ 53.

8. There will be no financial support from the department without good standing. "Good standing" indicates conforming to relevant rules, regulations, and ethical standards, as well as showing satisfactory progress towards the degree on a regular basis in terms of coursework and research. In this respect, the dissertation/thesis advisor plays pivotal roles as the advisor controls advising hold, runs funded projects (funding source for GTA), approves various graduate forms, and chairs the dissertation/thesis committee. The advisor's endorsement is an important foundation for the confirmation of good standing.

XIII. ADDITIONAL INFORMATION

1. **Joe'SS** (pronounced "Joe's") is short for Joe Miner's Self-Service (https://joess.mst.edu/), a web portal that is accessible anywhere and allows students access to their academic and financial information such as course enrollment, payment options and history, billing statements, financial aid information, transcripts, and degree audit. To access financial information and aid communication with the Cashiers and Student Financial Assistance Offices, students need to agree to e-Consent. For more information about Joe'SS, visit https://registrar.mst.edu/psinfo/.

2. It is beneficial to visit the websites of the Office of Graduate Education (https://grad.mst.edu/) and The Council of Graduate Students (https://cgs.mst.edu/) occasionally to get familiar with all the relevant rules and regulations, available resources, ongoing events, and new opportunities. They are also a good starting point when you face special situations and need certain help.

3. **Student code of conduct:** Student Honor Code can be found at this link: http://stuco.mst.edu/honor-code/. Conduct of students subject to sanctions can be found here: https://registrar.mst.edu/academicregs/conductofstudents/, and falls into the following categories:

    1) Academic dishonesty, such as *cheating*, *plagiarism*, or *sabotage*.
    2) Forgery, alteration, or misuse of University documents, records or identification, or knowingly furnishing false information to the University.
    3) Obstruction or disruption of teaching, *research*, administration, conduct proceedings, or other University activities, including its public service functions on or off campus.
    4) Physical abuse or other conduct which threatens or endangers the health or safety of any person.
    5) Stalking another by following or engaging in a course of conduct with no legitimate purpose.
    6) Academic dishonesty, such as cheating, plagiarism, or sabotage.
    7) Forgery, alteration, or misuse of University documents, records or identification, or knowingly furnishing false information to the University.
    8) Obstruction or disruption of teaching, research, administration, conduct proceedings, or other University activities, including its public service functions on or off campus.

9) Physical abuse or other conduct which threatens or endangers the health or safety of any person.
10) Stalking another by following or engaging in a course of conduct with no legitimate purpose.
11) Academic dishonesty, such as cheating, plagiarism, or sabotage.
12) Forgery, alteration, or misuse of University documents, records or identification, or knowingly furnishing false information to the University.
13) Obstruction or disruption of teaching, research, administration, conduct proceedings, or other University activities, including its public service functions on or off campus.
14) Physical abuse or other conduct which threatens or endangers the health or safety of any person.
15) Stalking another by following or engaging in a course of conduct with no legitimate purpose.
16) Hazing, participation or cooperation by the person(s) being hazed does not excuse the violation. Failing to intervene to prevent (and/or) failing to discourage (and/or) failing to report those acts may also violate this policy.
17) Misuse of computing resources in accordance with University policy.
    a. Actual or attempted theft or other abuse.
    b. Unauthorized entry into a file to use, read, or change the contents, or for any other purpose.
    c. Unauthorized transfer of a file.
    d. Unauthorized use of another individual's identification and password.
    e. Use of computing facilities to interfere with the work of another student, faculty member, or University official.
    f. Use of computing facilities to interfere with normal operation of the University computing system.
    g. Knowingly causing a computer virus to become installed in a computer system or file

4. **Research Integrity and Ethics** is an important graduate learning outcome. To provide additional insights and guidelines, and to address potential issues, a special seminar will be presented annually to the graduate students. The presentation slides and relevant materials will be made available to the students via email and department websites.

5. **Title IX:** Missouri University of Science and Technology is committed to the safety and well-being of all members of its community. US Federal Law Title IX states that no member of the university community shall, on the basis of sex, be excluded from participation in, or be denied benefits of, or be subjected to discrimination under any education program or activity. Furthermore, in accordance with Title IX guidelines from the US Office of Civil Rights, Missouri S&T requires that all faculty and staff members report, to the Missouri S&T Title IX Coordinator, any notice of sexual harassment, abuse, and/or violence (including personal relational abuse, relational/domestic violence, and stalking) disclosed through communication including but not limited to direct conversation, email, social media, classroom papers and homework exercises.

Contact Missouri S&T's Title IX Coordinator (203 Centennial Hall; 573-341-6038) to report Title IX violations. To learn more about Title IX resources and reporting options (confidential and non-confidential) available to Missouri S&T students, staff, and faculty, please visit http://titleix.mst.edu.

6. **Disability Support:** If special accommodations are needed for research and classes due to certain documented and approved disability, please consult the Disability Services staff at 204 Norwood Hall, Tel: 341-4211, email: dss@mst.edu, web: http://dss.mst.edu, your advisor and course instructors.

7. **Well-Being and UCARE** (https://go.mst.edu/ucare-report)
   Any of us may experience strained relationships, increased anxiety, feeling down, alcohol/drug misuse, decreased motivation, challenges with housing and food insecurity, etc. When your mental well-being is negatively impacted, you may struggle academically and personally. If you feel overwhelmed or need support, please make use of S&T's confidential mental health services at no charge. If you are concerned about a friend or would like to consult with a Care Manager, please make a UCARE referral for support and assistance.