

BIOMEDICAL ENGINEERING GRADUATE HANDBOOK

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Graduate Catalog

For the most up-to-date and accurate information about courses, curricula, degrees, policies, procedures, regulations, and requirements of the University, please refer to the Graduate Catalog: <http://catalog.msstate.edu/graduate/>

New Students

Your letter of acceptance contains information about how to proceed with your initial enrollment at MSU. Additional assistance for new students is available from the Office of Graduate Studies: <https://www.grad.msstate.edu/students/new-students>

Financial Aid

Research assistantships: Graduate research assistantships (GRAs) are part-time jobs that pay a stipend (salary) and most of the tuition and fees for full-time enrollment. Stipends vary according to qualifications and available funds. Research assistants are chosen by individual professors who have openings in their research programs. Specific duties and responsibilities are defined by the funding professor. In addition to being a source of financial aid, a research assistantship is an opportunity to gain hands-on research experience that will form the basis of a graduate thesis or dissertation. There is no formal application process for research assistantships, but all biomedical engineering professors have access to the files of graduate school applicants, and may choose to contact you about a GRA position. There is no set timetable for the awarding of GRAs. If you are offered an assistantship, you will be notified immediately and an official offer letter will be mailed to you.

Below are the Agricultural & Biological Engineering faculty members who are actively engaged in biomedical research. You are welcome to contact any of them directly for more information about his/her research and availability of assistantships:

Dr. Steven Elder, Professor and BME Graduate Coordinator (selder@abe.msstate.edu), cartilage regeneration and orthopaedic biomechanics

Dr. LaShan Simpson, Associate Professor (clsimpson@abe.msstate.edu), vascular calcification, cell and gene therapy

Dr. David Vandenhoeffer, Associate Professor (davidvdh@abe.msstate.edu), neural engineering

Dr. Lauren Priddy, Assistant Professor (lbpriddy@abe.msstate.edu), bone healing following injury and disease

Dr. Amirtaha Taebi, Assistant Professor (ataebi@abe.msstate.edu), intelligent medical decision making, tele-health monitoring, noninvasive patient monitoring strategies

Teaching assistantships: The ABE Department supports several Graduate Teaching Assistantships. All ABE graduate students with appropriate credentials who do not hold a GRA will be automatically considered for vacant teaching assistantships. There is no separate application. Graduate Teaching Assistants work under the direct supervision of faculty and staff and are assigned duties related directly to instruction, such as assisting in the preparation of lectures, leading discussion sections, conducting laboratory exercises, grading papers, and keeping class records. Advanced graduate students who have completed 18 graduate credit hours in their teaching discipline (seminar and research hours excluded) may be given primary responsibility for teaching an undergraduate course, including student assessment and assignment of final grades. GTAs cannot be assigned primary responsibilities for teaching and student assessment in courses approved for graduate credit.

Eligibility to serve as a GTA requires participation in the Graduate Teaching Assistant Certification Program prior to beginning the first teaching assignment at MSU. The student must satisfy all program/evaluation requirements necessary to obtain the level of certification (GTA1, GTA2, GTA3) that corresponds to the duties/responsibilities of the teaching assistantship appointment. Please refer to Graduate Teaching Assistantship Certification Program section of the Graduate Catalog for more information (<http://catalog.msstate.edu/graduate/graduate-assistantships/#graduateteachingassistantcertificationprogramtext>).

Service assistantships: Graduate Service Assistants aid faculty and staff members with administrative functions, and GSA appointments are available in many academic and non-academic units. Duties vary, depending on administrative needs of the unit making the award, and stipends vary according to the nature of assigned duties.

Many service assistantships are managed through the Division of Student Affairs, and an application is available on their website:

<https://www.saffairs.msstate.edu/assistantships/>.

Another way to be considered for service assistantships across campus is to file an application with the Graduate School:

<https://www.grad.msstate.edu/sites/www.grad.msstate.edu/files/inline-files/Application%20for%20Graduate%20Assistantship.pdf>.

ABE Assistantship Procedures (fees, insurance, etc.): If you hold an assistantship, please check in with the ABE Business manager at the beginning of each semester and ask if you are required to complete or sign any forms having to do with your stipend, fees, or insurance.

International Students

It imperative that assistantship-holding international students who travel outside the U.S. between semesters return before the first day of class. An international student who returns to MSU after the first day of class is at high risk of losing his/her assistantship.

Health insurance for international students will be assessed at the prevailing rate for the fall semester and for the spring/summer semester. All international students are required to purchase the International Health Insurance unless an acceptable, alternative policy can be proven and accepted by International Services, preferably prior to registration. Health insurance charges will not be removed after the 10th class day.

Curricula

The specific set of courses that a student uses to fulfill the curricular requirements below is referred to a Program of Study. Your Program of Study will be developed in consultation with your major professor and your thesis or dissertation committee.

Master of Science Curriculum (30 hours total)*

Required Courses (10 hours):

- ST 8114 Statistical Methods (4 credit hours)
- ABE 8621 Methods of Biomedical Engineering Research (1 credit hour)
- BIO 6514 Animal Physiology or BIO 6114 Cellular Physiology (4 credit hours)
- ABE 8801 Clinical Experience for Biomedical Engineering (1 credit hour)

Elective Courses (14 hours)

Research/Thesis (6 hours)

Additional Requirements: Thesis

Doctor of Philosophy Curriculum (80 hours total)*

Required Courses (13 hours)

- ST 8114 Statistical Methods (4 credit hours)
- ABE 8621 Methods of Biomedical Engineering Research (1 credit hour)
- BIO 6514 Animal Physiology or BIO 6114 Cellular Physiology (4 credit hours)
- ABE 8801 Clinical Experience for Biomedical Engineering (1 credit hour)
- Graduate-level mathematics course (minimum 3 credit hours)

Elective Courses (35-47 hours)

Research/Dissertation (20-32 hours)

A minimum of 48 GPA hours (regular classes) and 20 Research/Dissertation hours are required. Remaining hours required to reach a total of 80 can be either regular classes or Research/Dissertation.

Additional requirements: Qualifying Exam, Preliminary Exam, Dissertation

* A minimum of 12 coursework credit hours, exclusive of thesis/research credits, must be at the 8000 level. A maximum of 6 credit hours of Directed Individual Study (DIS)

coursework can be taken toward the degree. DIS courses are designated as 7000-level credit hours and may be used to meet the 8000-level course requirement.

CAPP: CAPP is an online program that compares your academic record to the degree requirements. If you and your major professor have agreed on all the elective courses you will take, then the Graduate Coordinator can customize your CAPP so that you may use it to monitor your progress towards completion of degree requirements. CAPP is accessed through the Banner tab of your myState portal under the Academic Records column.

Graduate Committees

An advisory committee should be selected by the student by consulting the major professor. The advisory committee is responsible for developing the student's Program of Study and conducting the preliminary/comprehensive exam(s) and the final thesis or dissertation defense. A completed committee request form must be submitted to the Graduate School. This form should be submitted no later than the semester in which the student plans to graduate for Master's students and no later than the semester in which comprehensive/qualifying exam is scheduled for Doctoral students, as appropriate.

A thesis or doctoral committee has several roles:

- Check and balances – MSU does not allow a sole professor to confer a graduate degree on a student. The purpose is to ensure that standards and guidelines are adhered to and to protect the university from giving too much power to an individual professor. The committee, therefore, provides a check and balance service to the university.
- Multiple sources of support - Committee members who get actively involved during a thesis or dissertation project can be a source of support, preventing the major professor from shouldering the entire responsibility. Getting advice from multiple sources is invaluable to the student, provided committee members do not place conflicting demands on the student.
- Multiple sources of expertise - Committees provide multiple sources of expertise to the student to ensure that the proper background and training are brought to bear on each aspect of the project. With multiple sources from which to draw expertise, the student is more likely to find the help that is needed in a timely manner. A thoughtfully composed committee will help to ensure that the student's research is rigorous and up to current standards in biomedical engineering.
- Accountability - Mentioned above, the committee plays an important (if not more important) role for the university in addition to the student. With multiple eyes watching what is going on, the process is less likely to become derailed by the missteps of a single person. Committee members create accountability by having

a say in what paths the student should take and what direction the student needs to follow to increase the chances of graduation.

Composition of the M.S. Graduate Committee

- A committee consists of a minimum of four members.
- The major professor is chair of the committee and must be a faculty member in the Agricultural & Biological Engineering Department.
 - A Non-Graduate Faculty committee member cannot serve as a major professor or committee chair.
- Besides the chair, at least one other member must be from the Agricultural & Biological Engineering Department.
- One member must be a clinician (CVM faculty, UMC faculty, or practicing clinician).
- Two or more members must be engineers.
- Greater than 50% of the master's committee members must hold a Graduate Faculty appointment. The decision regarding the qualifications of a Non-Graduate Faculty member to serve on a master's degree committee will be determined by the program/college.
- A Non-Graduate Faculty committee member can direct the thesis research.

Composition of the Ph.D. Graduate Committee

- A committee consists of a minimum of five members.
- The major professor is chair of the committee and must be a faculty member in the Agricultural & Biological Engineering Department.
 - A Non-Graduate Faculty committee member cannot serve as a major professor or committee chair.
- Besides the chair, at least one other member must be from the Agricultural & Biological Engineering Department.
- One member must be a clinician (CVM faculty, UMC faculty, or practicing clinician).
- Three or more members must be engineers.
- Three or more members must be MSU faculty members.

- Greater than 50% of the doctoral committee members must hold a Graduate Faculty appointment. The decision regarding the qualifications of a Non-Graduate Faculty member to serve on a doctoral degree committee will be determined by the program/college.
- A Non-Graduate Faculty committee member can serve as dissertation director.

Academic Advising and Registration

Your major professor will serve as your academic advisor. If you do not yet have a major professor, then you should seek academic advice from the Graduate Coordinator. Pre-registration advising periods that last for two weeks are scheduled every Fall and Spring semester. Pre-registration advising for the Fall usually takes place in mid-March immediately after Spring Break. Pre-registration advising for the Spring usually takes place in late October.

You must confer with your advisor or the Graduate Coordinator to determine courses for the subsequent semester and receive a release for online registration. To register, you may access the Registration menu on MyBanner for Students and click on Register for Classes to enroll.

Registration for Directed Individual Study (DIS) courses requires: (1) approval from a faculty member to offer that course and (2) that the course be developed by the department offering the course before a student can enroll.

When registering for thesis/dissertation hours, you must enroll in the campus and section of your major professor. The research hours must be in ABE. If you have not yet selected a major advisor, then consult the program Graduate Coordinator for assistance in registering for thesis/dissertation hours.

Full-time enrollment: A full-time course load in Fall and Spring semesters is enrollment in 9-13 credit hours. You may register for additional hours only by submitting to the Registrar's Office a Request for Scheduling Overload Form approved by the student's Graduate Coordinator, Department Head, and Academic Dean and sent to the Registrar for processing. This form must be sent to the Registrar. It does not require Graduate School approval. During the Summer, a total of 6 credit hours is considered full-time summer enrollment. The maximum Summer course load is as follows:

- 3 credit hours for Maymester
- 7 hours for a 5-week summer session
- 13 hours for the 10-week term
- a total of 13 hours for the entire summer semester

Continuous enrollment: You are required to remain continuously enrolled from the start of your program. Continuous enrollment is defined as enrollment in two of three

semester terms (Fall, Spring, or Summer) with Fall enrollment required. Unless you secure an official leave of absence, you will be deemed inactive after the second semester students of failing to meet these requirements.

Enrollment on Assistantship: A student holding an assistantship appointment is required to maintain full-time enrollment throughout the full appointment period. THIS INCLUDES SUMMER, when at least 6 hours is needed to be enrolled full-time. A student holding a half-summer graduate assistantship must be registered during the term of the assistantship.

Biomedical Engineering Graduate Examinations

M.S. Thesis

The BME M.S. thesis consists of a written document, which must be submitted to the Graduate Committee and orally defended before this committee. It is the responsibility of the graduate student to be sure to follow all Office of Graduate Studies policies regarding fulfilling the requirements of the thesis defense (<http://catalog.msstate.edu/graduate/academic-policies/masters-requirements/#thesistext>). In particular, the student should be sure and check the Graduate School Calendar to verify that the various deadlines are met to ensure that they can graduate in a given semester. The written document must follow the formatting guidelines established by the Office of Thesis and Dissertation Format Review at the Mitchell Memorial Library. Once the M.S. thesis has been successfully defended and the thesis submitted to the Program and the Library, then the candidate is eligible to graduate with his/her BME M.S. degree.

The M.S. thesis itself should be submitted to the Committee at least two weeks prior to the scheduled defense. Typically, a complete draft of the thesis is submitted to the candidate's Major Professor at least four weeks prior to the scheduled defense. He/she would suggest revisions to this draft, which the candidate would incorporate before a final draft is submitted to the Committee as a whole.

There is no maximum or minimum length of a M.S. thesis. Typically, it is shorter in length than a doctoral dissertation, as the M.S. original research project is appropriately smaller in scope compared to doctoral dissertation research. Questions about the length and specific content should be directed to the candidate's Major Professor. In general, it is the responsibility of the Major Professor to make sure that the candidate has completed sufficient research and that the thesis is of adequate quality before it is allowed to be submitted to the thesis committee.

The Program Coordinator should be notified at least two weeks prior to the scheduled defense date so that an announcement can be disseminated. The oral defense of the M.S. thesis consists of both a public and a private portion, which in total will typically last less than two hours. The public portion consists of an oral presentation, which lasts from 20 – 40 minutes, and should be developed for a mixed audience of faculty and graduate students, many of whom will not be experts in the specific research field. A question and answer session occurs at the end of the oral presentation by the candidate and is typically from 10 – 20 minutes in length. The Major Professor is responsible for chairing both the public presentation and the private defense. As such, he/she will introduce the candidate to the public audience and explain to the audience the guidelines for asking questions, etc. At the conclusion of the public presentation, the Major Professor will ask the public to leave so that the committee can ask questions of the candidate to examine the extent of their mastery of the research project. Once the thesis committee has concluded asking questions, the candidate will be asked to leave

so that the committee can vote either Pass or Fail (as indicated on a Report of Examination Results eform) and decide whether they will accept the candidate's thesis. Typically, the committee will make recommendations for revisions to the thesis, though the committee may also accept the thesis as submitted. If the committee decides that the thesis is not acceptable, then the committee will provide the candidate with written comments regarding what is deficient and what would be necessary to make the thesis acceptable. Committee members will indicate their acceptance of the final version by signing the Electronic Thesis and Dissertation Committee Acceptance form, which the student submits to the library.

Comprehensive/Qualifying Examination for Ph.D. Program

This examination is required. For students admitted without a M.S. degree, it will typically be administered near the end of the second year of graduate study. For students holding a M.S. degree at the time of admission, this exam will typically be administered upon completion of the first year of graduate study. No student will be eligible to take the Comprehensive Exam until he or she has been enrolled in the program for at least one year and has completed at least 24 credit hours of graduate coursework. Students who have no contingencies on admission must take the Comprehensive Exam within 3 years of initial program enrollment. A student who is admitted with contingencies may request a 12-month extension of this deadline from his or her major professor. The exam is administered by the student's graduate committee, which is responsible for determining its content and format and informing the student thereof. The committee decides (by majority vote if necessary) whether the examination is "pass" or "fail". A student who fails the exam is given one opportunity to retake it. Failure on the second attempt will result in termination from the program. The major professor is responsible for reporting the Comprehensive/Qualifying Exam result to the Program Coordinator.

Preliminary Examination (Dissertation Proposal)

Following successful completion of the BME Comprehensive/Qualifying Examination, the next step in a doctoral student's progress is his or her Doctoral Dissertation Proposal Defense. This proposal defense must be completed within 12 months of passing the Comprehensive Examination. The dissertation proposal is a written document which will provide the committee with sufficient information to determine whether the proposal meets the standards for a doctoral dissertation in BME. This document must follow guidelines and explicitly address criteria of NIH or NSF. In general, it consists of the following sections: Abstract, Table of Contents, Introduction, Background & Significance, Hypotheses, Preliminary & Previous Studies, Research Design & Methods, Timeline for Completion, Human &/or Animals Justification (if appropriate), and References Cited. Although the Program in Biomedical Engineering

does not set a page limit, the dissertation committee may do so. Most acceptable proposals are 15-25 pages. The written proposal should be submitted to the dissertation committee two weeks in advance of the scheduled oral defense.

The oral defense consists of a public presentation, followed immediately by a private session with the candidate's committee. The essential determinant is whether the proposed studies will be necessary and sufficient to constitute a doctoral dissertation in BME. If the committee approves the proposal, then there should be general agreement between the committee and the candidate that if the candidate performs the studies as proposed, then the committee should be favorably disposed in the future to approving the dissertation. That is, if the candidate performs the proposed experiments, analyses, and interpretations, then this would be sufficient for the dissertation. It is, of course, recognized that unexpected findings may require deviation from the proposal. One of the committee's roles is to advise and consult with the candidate on a periodic basis and to monitor his or her progress.

The Major Professor is responsible for submitting a completed Report of Examination Results form to the Program Coordinator. If the committee does not approve the proposal, then the committee should provide direction to the candidate as to what is deficient and allow the candidate further time to revise and then to develop a new proposal. The new proposal would follow the same guidelines as the previous proposal, requiring a new written document and oral defense. A student who fails the exam is given one opportunity to retake it.

Ph.D. Dissertation

The BME Doctoral Dissertation Defense represents the culmination of a doctoral student's studies and research. The dissertation is a written document that must follow the formatting guideline set forth by the Office of Thesis and Dissertation Format Review. It is the responsibility of the graduate student to be sure to follow all Office of Graduate Studies policies regarding fulfilling the requirements of the doctoral dissertation defense (<http://catalog.msstate.edu/graduate/academic-policies/phd-requirements/#dissertationtext>). In particular, the student should be sure and check the Graduate School Calendar to verify that the various deadlines are met to ensure that they can graduate in a given semester. The dissertation defense cannot occur earlier than six months after the Preliminary Examination.

In general, the written dissertation should be developed in close consultation with the student's Major Professor. During the student's dissertation research, the student should schedule periodic meetings with all the committee members who can reasonably attend said meetings. The purpose of these meetings is to ensure that the committee is in agreement with the general flow of the research and that the student is following the previously agreed upon research plan (which was presented and approved at the Doctoral Dissertation Proposal Defense). At the conclusion of the dissertation research,

the written dissertation should be presented to the entire dissertation committee at least two weeks before the scheduled dissertation defense.

The Program Coordinator should be notified at least two weeks prior to the scheduled defense date so that an announcement can be disseminated. The oral defense of the dissertation consists of both a public and a private portion. The public portion typically consists of an oral presentation, which usually lasts approximately 30 minutes, and should be developed for a mixed audience of faculty and graduate students, many of whom will not be experts in the specific research field. A question and answer session occurs at the end of the oral presentation by the candidate and is typically from 10 – 20 minutes in length. The Major Professor is responsible for chairing both the public presentation and the private defense. As such, he/she will introduce the candidate to the public audience and explain to the audience the guidelines for asking questions, etc. At the conclusion of the public presentation, the Major Professor will ask the public to leave so that the committee may ask questions of the candidate in private. Once the dissertation committee has concluded asking questions, the candidate will be asked to leave so that the committee can vote either Pass or Fail (as indicated on a Report of Examination Results form) and decide whether they will accept the candidate's dissertation. Typically, the committee will make recommendations for revisions to the dissertation, though the committee may also accept the dissertation as submitted. If the committee decides that the dissertation is not acceptable, then the committee will provide the candidate with written comments regarding what is deficient and what would be necessary to make the dissertation acceptable. Committee members will indicate their acceptance of the final version by signing the Electronic Thesis and Dissertation Committee Acceptance form, which the student submits to the library.

Thesis and Dissertation Formatting and Submission

The student must be enrolled in at least one graduate credit hour and LIB 9010 at MSU during the semester(s) of both the initial and final submissions to the Library. A student submitting in the summer semester may be enrolled in any summer term. LIB 9010 Electronic Thesis/Dissertation Format and Submission (0 hours) is designed to assist students with the format and submission process for turning in Theses and Dissertations before graduation. LIB 9010 must be taken during student's final semester.

An outline of the submission process can be found on the library's website:

<http://lib.msstate.edu/thesis/process/>.

Academic Performance

University Minimum Degree Completion Requirements: You must complete all University and degree program requirements listed in the *Graduate Catalog* under which you began the program. You cannot graduate under any of the following circumstances.

1. A GPA lower than 3.00 for all courses attempted for graduate credit after admission to the degree program or
2. A grade of D or lower for all courses attempted for graduate credit after admission to the degree program or
3. A grade of I (Incomplete) on your transcript.

No graduate courses with pass/fail credit are accepted as part of a graduate program. Grades of pass/fail are not awarded at MSU and cannot be transferred to MSU.

A GPA of 3.00 on the minor coursework is required for students completing a minor.

BME: Unsatisfactory performance in the graduate program in Biomedical Engineering is defined as any of the following.

- Failure to maintain a B average in attempted graduate courses after admission to the program
- A grade of D or F in any course
- More than two grades below a B
 - *Upon earning the third course grade lower than a B, one of these courses must be retaken and you must earn a grade of B or higher. You have only one opportunity to retake a course.*
- Failure of the qualifying or preliminary exam (Ph.D. students only)
- Failure of the thesis/dissertation defense
- Unsatisfactory evaluation of a thesis or dissertation
- Receiving a second grade of U in ABE 8000 Research/Thesis or ABE 9000 Research/Dissertation (A student who receives a grade of U will be placed on academic probation the following semester. A second grade of U in ABE 8000/9000 in the probationary semester or any thereafter will result in dismissal from the program.)

Any one of these or a combination of these will constitute the basis for review for possible dismissal. The graduate coordinator will review the record along with the

student's graduate committee and take a final course of action which will be recommendation for immediate dismissal or the establishment of a probationary period in which corrective action must take place. Appeal of dismissal can be made by submitting a written appeal statement to the department head. If the dismissal is upheld by the department head upon the student's appeal, the student can then submit a written appeal to the dean of the College of Engineering.

Office space and computing resources

Cubicles for ABE graduate students are available in ABE Room 300. Your advisor can request from Kimberly Young, Business Coordinator, that a vacant cubicle be assigned to you.

For completing assigned coursework and for the majority of research-related tasks involving use of Microsoft Office, ImageJ, SPSS, and other software available for download from MSU Information Technology Services, you are expected to use your personally owned computer. If your thesis/dissertation research involves use of software not freely available from ITS or it cannot be accomplished using personal computers in general, then your advisor will arrange access to the necessary computing resources.

Use of laboratories

Access: Third floor laboratories in the ABE Building have electromagnetic locks. Some are open during normal business hours, and some require an authorized MSU ID for entrance at all times. You may request 24/7 access to specific laboratories by submitting a lab access request form to the ABE front office:

https://www.abe.msstate.edu/wp-content/uploads/ABELabAccessForm_2019.pdf

Training: The completion of specific training courses may be required prior to starting work in certain laboratories. Consult your advisor and this information from the Office of Biosafety: <https://www.ehs.msstate.edu/focus-areas/biosafety/training>

To work in ABE 335 and 345, it is required that you review the Biosafety Manual (located in 345) and sign the Acknowledgement of Risk page.

Equipment: Each piece of equipment in the laboratories belongs to a particular ABE investigator. Although most equipment is shared among all users of the laboratories, you should not use any equipment without first getting permission from your advisor. Also, do not attempt to use any piece of equipment before being properly trained. Again, seek advice from your advisor regarding who can provide training. Make sure that each piece of equipment is clean and shut down appropriately after use. In general, it is safe to wipe down equipment with 70% ethanol. Do not clean equipment with bleach. Immediately report to your advisor any instances of equipment malfunction or accidental damage.

Reusable supplies: Reusable supplies such as tools, glassware, metal instruments, and magnetic stir bars, unless specifically purchased for your project, are considered communal property. They should be cleaned, disinfected, and returned to their designated storage location. Do not “hoard” such items in drawers or cabinets where you store other supplies dedicated to your project.

Disposable supplies: With the exception of ethanol, hand soap, paper towels, and trash bags, all consumable laboratory supplies, including PPE, is to be provided by your advisor. This includes tissue culture plasticware, gloves, pipette tips, centrifuge tubes, Kimwipes, weigh paper, etc.

Chemicals and media: Consult with your advisor about which chemicals and media you may use. Each was purchased by an investigator for certain projects. However, excess left over after a project is completed may be available to all users, depending on the preference of the investigator.

Distilled water: There is a water distiller in the ABE basement. The distilled water it produces is available to all lab users. You are responsible for bringing water from the distiller to the lab as needed.

Hazardous chemical waste disposal: It is not safe for many chemicals to be poured down the drain. Check the Material Safety Data Sheet and check with your advisor before disposing of any chemical by pouring into the sink. Containers for hazardous waste are located in ABE 345 near the chemical fume hood. Make sure you add your waste to the appropriate container. Ask your advisor if you are not sure about the container in which your waste belongs. Report to your advisor when a waste container is full so that a request can be made for pick up by the Environmental Health and Safety Office.

Decontamination and disposal of biohazardous waste: All cell/tissue culture waste must be decontaminated prior to disposal.

- Liquid waste should be treated with bleach (~10%) for 20 minutes before it can be poured down the drain.
- Solid waste, except serological pipettes, should be collected in a red biohazard bag. Flasks and tubes placed in a biohazard bag should be emptied of all liquid and should be uncapped. This waste will be sterilized by autoclaving, and steam cannot easily penetrate a closed container. Do not place foil or paper wrappers in a biohazard bag. They can be thrown away in the regular trash.
 - Serological pipettes should be placed in a plastic storage bin inside the biosafety cabinet. When the container is full, the pipettes should be treated with 10% bleach for at least 20 minutes before they can be discarded with other trash.
 - Needles and scalpel blades should be discarded in a red sharps container. Sharps containers should be closed and autoclaved when they are approximately 2/3 full. Closed, autoclaved containers can be added to the regular trash.
 - It is your responsibility to autoclave your own biohazardous waste. See the laboratory director and/or your advisor for instructions. Printed instructions are located next to the autoclave in ABE 335. Autoclaved

biohazard bags should be labeled as “Treated Waste,” placed inside opaque black garbage bags, and discarded with the regular trash.

- Almost all animal carcasses and tissue should be discarded in the regular trash. Do not place tissue or carcasses in a red biohazard bag or autoclave. Exceptions are when you are working with known pathogens and any human tissue. Those should be collected in red biohazard bags, labeled appropriately, and stored in the waste chest freezer in ABE 345. Your advisor will arrange for Stericycle to pick up this biohazardous tissue.

Emptying trash: All users in the lab are responsible for taking full trash bags from the lab to the dumpster located inside a gated, brick enclosure behind the ABE building.

Graduation

A candidate for a degree must apply for graduation online via MyState and pay the required fee by the final date set by the Registrar for the semester of graduation. Deadline and fee information are posted on the Graduate Academic Calendar and on the Registrar's website. The degree applicant must arrange cap and gown rental through the MSU Barnes & Noble Bookstore. A candidate for a degree should be present at commencement for the official conferring of the degree.

A student who applies for graduation in a certain semester but does not graduate must apply again in a subsequent semester. The applicant will pay a fee for the new application, as degree applications and application fees shall not be applied to future semesters.

Follow the procedure outlined by the Graduate School to ensure that you're staying on track for graduation: <https://www.grad.msstate.edu/students/graduation>. This includes enrollment in the LIB 9010 course during the graduating semester.

A special requirement of the Bagley College of Engineering is completion of the **Graduate Exit Survey**. In order to secure the signature of the academic dean, three documents are required:

1. Graduate Exit Survey
2. Copy of Abstract
3. Original Thesis/Dissertation Signature Approval Page
(NOTE: ALL SIGNATURES MUST BE PROVIDED PRIOR TO THE SIGNATURE OF THE ACADEMIC DEAN).

These three documents must be hand delivered to **Erma Murry (662.325.9156)** in room 250 McCain. Provide your email address; Ms. Stafford will contact you via email regarding pickup of the signed Signature Approval Page. Please make arrangements with your academic adviser for the pickup or hand delivery of your documents.

Paperwork

Student's Responsibility

- Committee Request Form (e-form)
- Electronic Thesis and Dissertation Committee Acceptance Form
- Bagley Graduate Exit Survey
(<https://cas.its.msstate.edu/cas/login?service=https%3A%2F%2Fwww.bagley.msstate.edu%2Fforms%2Fbcoeprograms%2Fgradexit>)
 - Ph.D. only: Survey of Earned Doctorates (<https://sed-ncses.org/login.aspx>)

Major Professor's Responsibility

- Report of Examination Results
 - M.S.: Thesis Defense
 - Ph.D.: Preliminary Exam and Dissertation Defense
- Thesis Defense Evaluation
- Preliminary Exam (Dissertation Proposal) Evaluation
- Dissertation Defense Evaluation

Graduate Coordinator's Responsibility

- CAPP
- Graduation Checklist