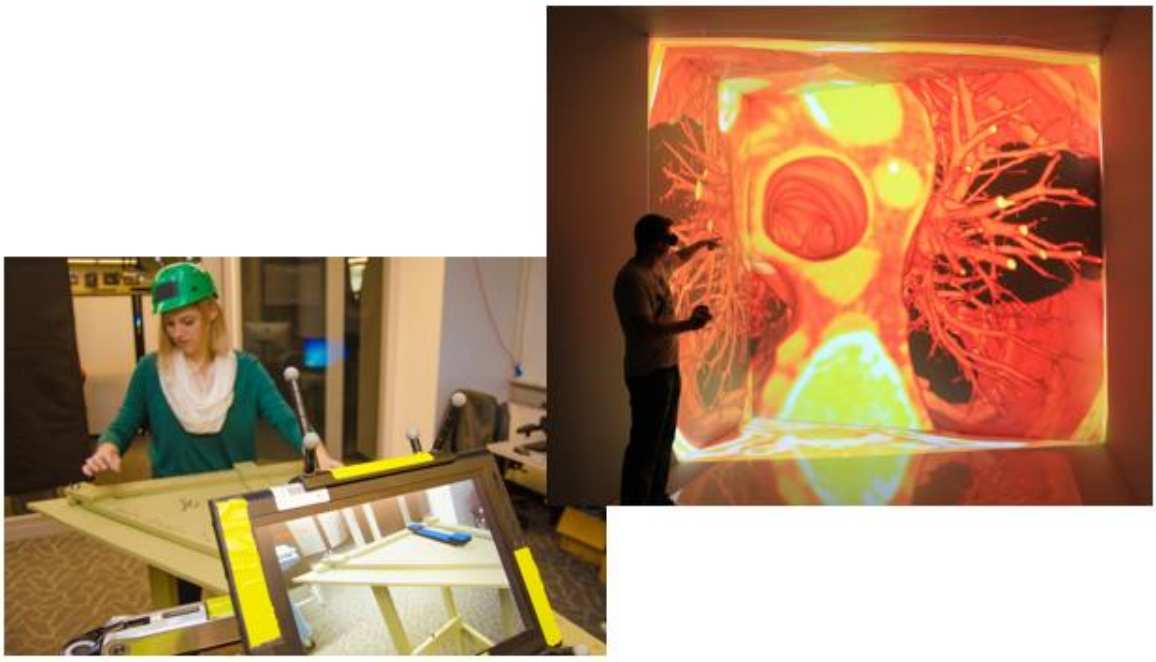
IOWA STATE UNIVERSITY
Department of Mechanical Engineering

Knowledge. Innovation. Leadership.

Mechanical Engineering Graduate Student Handbook



2017-2018

Department of Mechanical Engineering
Iowa State University

Rev. August 2017
AC/HG

Welcome to the Mechanical Engineering Graduate Program at Iowa State University. We are excited to have you join our vibrant program and are eager to help your graduate educational experience be an enjoyable and rewarding one.

This student handbook is provided to give you general guidance about practices, policies and procedures related to your graduate career in our department and University. It is in accordance with the Graduate College Handbook which provides more detailed information on policies and can be found online at http://www.grad-college.iastate.edu/common/handbook/.

Since our Graduate Program continually seeks to improve, some changes may occur between annual printings of this handbook. Consequently, you should stay in close communication with your major professor at all times to verify important curricular and policy issues. We also encourage you to bring questions, comments and concerns to the Graduate Programs Office at any time. We look forward to helping you during your tenure here.

Best wishes

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2019 Black Engineering

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ME Grad Programs Website
http://www.me.iastate.edu/graduate-program/

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Graduate Timetable

Upon arrival:

- International students – Check in with Office of International Students and Scholars at 3248 Memorial Union
- Check in with the ME Grad Programs Office (2019 Black Engineering)
- Receive key forms for office, lab and exterior door key from Department Office 2025 Black Engineering
- Get your ISUCard in 0530 Beardshear Hall
- Students on assistantships - Sign up for payroll in the Human Resources Office at 3810 Beardshear Hall (take a copy of your official Letter of Intent, and 2 forms of ID other than ISUCard)
- Students on assistantships - Sign up for benefits at Student Insurance, 0570 Beardshear Hall
- Meet with major professor for course registration (including ME 600)
- Sign up for an E-mail account online through AccessPlus or in the Solutions Center, 195 Durham Center
- International students (non-native speakers of English) should take the English Placement Test
- International students on TA appointments should take the SPEAK/TEACH Test
- Attend Orientations
    - All students should attend ME New Student orientation (mandatory)
    - Students on TAs should attend New TA orientations conducted by CELT.
    - Students should complete Basic Safety Orientation conducted by EH&S.
- Obtain keys (after 24 hours) from the Key Issue Office, General Services Building

During the first semester:

- If DOGE is temporary advisor, identify permanent major professor
- Receive Safety Training
- International Students must register for and take English Placement Test (EPT) *and* the Oral English Certification Test (OECT)

Within first six months (PhD):

- Identify Program of Study Committee
- Determine date and structure of Qualifying Exam

Within two semesters:

- Identify Program of Study Committee
- Submit online Program of Study forms through AccessPlus

Within one year of entry (PhD):

- Complete the Qualifying examination and turn in form to ME Graduate Programs Office

Within two years after being admitted to the Ph.D. program:

- Submit online "Request for Preliminary Oral Exam" to Graduate College 2 weeks before exam date
- Complete Preliminary Oral Exam

During semester of graduation:

- Submit Application for Graduation on AccessPlus
- Submit online "Request for Final Oral Exam" to Graduate College 3 weeks before exam date
- Complete Final Oral Exam
- Submit "Graduate Student Approval Form" to Graduate College after passing your final oral (MS/PhD)
- Submit "Request for Graduation Check/Approval" form to Graduate College (MEng)
- Upload final thesis to ProQuest/UMI
- Return keys

Starting Out

Arrival and Check-in

International students must first check-in with the International Students and Scholars Office located in 3248 in the Memorial Union. Once you have checked-in with ISSO, you will need to check-in with the Mechanical Engineering Graduate Programs Office located in 2019 Black Engineering. Make sure to bring your packet from ISSO with you. Domestic students can check-in directly with the Mechanical Engineering Graduate Programs Office. You can find your way around campus using the online maps page at http://www.fpm.iastate.edu/maps/. We will give you a welcome package, instructions on procedures to complete before the semester starts and answer any questions may have.

New students or returning students who have not previously worked for the university will need to sign up for payroll in the Human Resources Office, 3810 Beardshear Hall. While in Beardshear, make sure you stop by Student Insurance (Rm 0570) to sign up for benefits. Please note that students on assistantships must have a signed Letter of Intent (LOI) on file with the ME graduate programs office before the start of semester. Your first paycheck for your assistantship or fellowship can be between two weeks to a month after you arrive due to procedural delays. Please plan for finances accordingly. You are able to sign up for an email account online through AccessPlus or can stop by the Solutions Center in 195 Durham Center.

Orientations

New graduate students must attend several orientations during the week prior to start of classes. For new graduate students, the academic year begins with a mandatory ME Graduate Student Orientation event (usually the Friday before classes start) designed to introduce you to the M E department and its procedures as well as ease the transition to graduate study at Iowa State. This is a time to become acquainted with the Mechanical Engineering Graduate Program and its members, and to prepare for registration and the start of classes.

In addition to participating in the ME orientation events, students also will take part in the following orientation activities:

- Graduate College Orientation with Graduate and Professional Studies Student Senate http://www.grad-college.iastate.edu/news/news.php?id=057
- TAs will attend the TA orientation seminars conducted by the Center for Excellence in Teaching and Learning
- International students should check with International Students and Scholars Office (ISS) for additional orientations (http://www.isso.iastate.edu)

Safety Training

All M.S. and Ph.D. students **must complete** Basic Safety training presented by the Environmental Health & Safety (EH&S) during the week prior to start of classes. This is a mandatory training required under state and federal law for all new employees and for any employees who have not received prior ISU training. More information can be found in the welcome package. The package also lists additional mandatory web-based training that new students must complete during the first semester. Topics will include: OSHA Laboratory, Standard procedures, Material Safety Data Sheets, Prior Approval Procedures, Laboratory Hazards, Personal Protection, Housekeeping, Containers and Labeling, Hazardous Waste Disposal and Electrical Safety, and other necessary training to meet your research lab's specific needs.

English Requirement

Students whose native language is not English MUST take a special examination called the English Placement Test (EPT) to assess suitability for classroom education at ISU. This test is held the week before classes start. Further information can be found at http://engl.iastate.edu/ept/index.html. Students not passing this exam are placed in one or more of the courses in English 101 during the pre-registration process at orientation. These courses may be taken on a pass-not pass basis.

In addition international students having Teaching Assistantship (TA) appointments must also take the Oral English Certification Test (OECT) (http://acp.grad-college.iastate.edu/?q=node/15). Successful certification is required to assume TA duties so we ask that all international students complete the OECT within the first year.

Major Professor

Every graduate student must select a major professor to work with. The role of the major professor is to act as a mentor to the student in all aspects of graduate study including research and guide the student's professional development. Most students who have accepted assistantship positions have already selected a major professor as explained in the admission letter. If you have been assigned a temporary major professor (usually the Director of Graduate Education), you are encouraged to meet with our department faculty during the first semester and select a major professor by the end of the first semester in the program. Selection should be based on matching of research interests, expectations and personalities. A list of faculty and their research expertise is available in Appendix D. Masters of Engineering students are typically assigned the DOGE as their major professor to help guide their course selections – however they may choose a different major professor.

Assistantships, Stipends, and Tuition Scholarships

Assistantship appointments are determined by your major professor. The terms of your assistantship are described in the original offer letter and in the Letter of Intent (LOI) Form you have signed. Please note that students on assistantships must have a signed Letter of Intent (LOI) on file with the ME graduate programs office before the start of semester. The student's major professor will advise him or her of the duties of the appointment and the accountability procedure. Assistantship appointments are reviewed every semester and the student will be advised of the nature of the next semester's appointment prior to the end of the term of appointment. You must be registered for at least two credits in order for you to be assigned and keep an appointment. All assistantship appointments are contingent on the availability of funds and maintaining satisfactory progress toward your degree.

The Graduate College sets minimum and maximum stipend ranges for graduate students. If your assistantship is an RA, your monthly stipend will be set by your major professor. If you appointment is as a TA, your stipend is set by the department. Students on assistantship will also receive a tuition scholarship. MS students on ½ time appointments will receive a ½ tuition scholarship and PhD students on a ½ time appointment will receive a full tuition scholarship. Both will be responsible for covering their fees each semester unless otherwise specified. Graduate students on assistantship are assessed tuition at the full-time rate in the fall and spring semesters and per credit hour over the summer. During the summer term, most professors cover the equivalent tuition for the 1 required credit (50% for MS, 100% for PhD), but it is up to the discretion of the major professor if they would like to cover more.

Please refer to the Graduate College handbook for more specifics regarding assistantships, stipends, and tuition scholarships: http://www.grad-college.iastate.edu/handbook/

Registration for classes

Registration for classes must be done as soon as possible. Consult with your major professor regarding the courses you want to take for your first semester. Information on course offerings can be found on the online Schedule of Classes (http://classes.iastate.edu/). Students then register using the AccessPlus registration system which is available on the ISU homepage (www.iastate.edu). Incoming students are encouraged to register for classes before arriving on campus. As a new student, enter your social security number (no hyphens) and month and day of your birth (mm/dd). International students who do not yet have a social security number should use the number assigned in the admission packet from the Office of Admissions. A $20 late fee is assessed to students who wait until the first day of classes to register. The late fee goes up each of the following two weeks to a maximum of $100.

It is important to register for classes early in the registration period. Students who have accepted assistantship offers must be registered for classes for the appointment to be electronically processed by the University (for stipend and tuition scholarships). Space may be limited in classes and the sooner you register, the better chance you have at taking the classes you need.

Please note all on campus MS and PhD students MUST register for ME 600 during every semester (see below for more details). Domestic students with graduate assistantships must adhere to the graduate college guidelines for minimum course requirements. International students with graduate assistantships must check their visa requirements for minimum course requirements. If visa requirements are less than those of the graduate college, students must follow the graduate college guidelines.

ME 590/599/690/699

Courses such as independent study (M E 590/690), creative component (M E 599) and research (M E 699) will not have reference numbers listed in the Schedule of Classes. Students will see a message to 'see department'. Students can obtain section and reference information from the Graduate Programs Office, 2019 Black.

After initial registration, adjustments to a student's schedule (e.g. course adds and drops, section changes and credit changes) can be made using AccessPlus until the end of the first week of classes. After the first week, all changes must be submitted on a *Request for Schedule Change* or *Restriction Waiver* form (better known as an Add/Drop Slip), which is available in the ME Grad Programs Office.

Transportation

Bicycles

All bicycles must be registered with the university's parking division. Bikes must be parked in the provided bicycle racks. Bicycle racks are located throughout campus. Bikes are not permitted inside any university buildings. Registration (free for bicycles) can also take place online at http://www.parking.iastate.edu/permit/bike/.

Buses

CyRide is the Ames bus system. Students can ride all CyRide routes free of charge upon presentation of a current *ISU* card. During the school year, buses leave from most locations every 10-20 minutes. Schedules are widely available throughout the campus. Further Cy-Ride information can be found at http://www.cyride.com.

Cars and Parking

Student parking permits can be purchased through the Parking Division. You can learn more information about your permit options at http://www.parking.iastate.edu/permit. A copy of the ISU Traffic and Parking Regulations can be obtained from Public Safety, Parking Division, 27 Armory (also available online at http://www.parking.iastate.edu/about/). Consult the handbook section pertaining to students.

Progressing Through the Degree Program

In working towards a graduate degree, ME students must fulfill the requirements of both the Graduate College and the Department. These include selecting an advisory committee, developing a Program of Study, passing Qualifying (PhD only), Preliminary (PhD only) and Final Oral (MS and PhD only) Examinations, as well as, meeting coursework and other general requirements. (Graduate College requirements are discussed in more detail in the Catalog and the Graduate College Student Handbook (http://www.grad-college.iastate.edu/common/handbook/).

Program of Study Committee Selection

Each graduate student, in collaboration with his or her major professor, shall identify the faculty members to serve on an advisory committee, also called the Program of Study (POS) Committee. This committee guides and evaluates the student during the period of graduate study.

Normally the student will ask individual faculty members to serve on the committee after consultation with the major professor. After the selected faculty members have agreed to serve on the committee, this information can be entered into AccessPlus as part of the POSC process. It is strongly encouraged that a student's POS **be submitted no later than the end of the first year** of the student's graduate work. It is highly recommended that **Ph.D. students determine their committee within 6 months** of starting graduate work as they must have their POS committee determined before their Qualifying Exam. A student's POS must receive final approval by the Graduate College no later than the term before the preliminary oral examination (doctoral candidates) or final oral examination (master's candidates) and no changes should be made. In order for the committee to be approved in any given term, the form must be submitted to the Graduate College by the published deadline for that term.

Master's POS Committee Makeup

For a master's student, the committee must have at least three faculty members with at least two members from the department and at least one member from outside your area of emphasis (preferably outside ME). Such faculty members must be members of the graduate faculty (names are listed in the Catalog). Master of Engineering students do not require a committee – their major professor is their mentor and guide who helps them select the courses required for the degree.

Doctoral POS Committee Makeup

For a doctoral student, the committee must have at least five faculty members with at least three members from the department and at least two from outside your area of emphasis (preferably outside ME). The faculty members must be members of the graduate faculty.

POS with Minor

If a graduate minor has been declared, a graduate faculty member from the minor program or interdepartmental minor must serve on the POS committee. The major professor and the representative from the minor field may not be the same person.

POS with Dual Majors or Co-Majors:

Co-chairs are required in the following instances:

- When a student has a co-major, each of the major fields must be represented by a different major professor, which will require the designation of co-major professors. However, the same person, if a faculty member in both majors, will be allowed to serve as major professor for both majors.
- When master's or Ph.D. work is administered through a program in which the largest share of course credits is taken, but the research is conducted or shared with another program or major and also supervised by a graduate faculty member in that program, both the master's or dissertation supervisor and a member of the graduate faculty from the program in which the degree will be granted can be designated as co-major professors.
- An approved committee for a double degree must include co-major professors from each of the programs. Only certain programs have been approved for double degrees

Changes to POS Committee

Recommendations for changes in the POS committee for a master's or Ph.D. degree must have the approval of the student, major professor, DOGE, and all committee members involved in the change before seeking approval of the Graduate College. These changes must be approved by the Dean of the Graduate College **before the preliminary or final oral examination is held**.

Program of Study (POS)

After appointment of the POS Committee, the student and the major professor develop a Program of Study. This is a list of the courses the student proposes to take during the period of graduate study. Courses that appear on the POS, and which are used to meet degree requirements, may not be taken in the pass-not pass system, and all courses used to meet degree requirements must appear in the Catalog. The POS is prepared after consultation with the major professor and is submitted through the POSC system on AccessPlus. It is required for Ph.D. students, and recommended for M.S. students, that the student meet with the POS Committee to discuss the POS and the student's proposed research. This POSC is submitted to the Graduate College after all members of the POS Committee, the student, and the DOGE have approved it. As per the graduate council guidelines, POS may not include more than three undergraduate classes- either up to three courses at 400 level courses or one 300 level and up to two 400 level courses. **It is recommended that the Program of Study be completed by the end of a student's first year of their graduate studies.**

Acceptability of Independent Study/Special Topics (ME 590/690) courses

Independent study/special topics courses can also count towards your degree as noted in the above requirements. In order for the DOGE to approve M E 590/690 courses, you must submit a 590/690 Independent Study Approval Form to the grad programs office (available on the ME Grad Program Forms Website, http://www.me.iastate.edu/graduate-program/degrees-and-programs/forms/).

Transfer Credits

At the discretion of the POS committee, and with the approval of the program and the Graduate College, graduate credits earned as a graduate student at another institution or through a distance education program offered by another institution may be transferred if the grade was B or better. Such courses must have been acceptable toward an advanced degree at that institution and must have been taught by individuals having graduate faculty status at that institution. If a student wishes to transfer credits from graduate courses taken at or through another university as an undergraduate student, it is that student's responsibility to provide verification by letter from that institution that those graduate courses were not used to satisfy undergraduate requirements for a degree. (Grades from courses taken at another institution will **not** be included in ISU grade calculations, nor will the grades display on an ISU transcript.)

A transcript must accompany the POS in order to transfer credits. The POS committee may ask for other materials, such as a course outline or accreditation of the institution, to evaluate the course. Transfer courses not completed when the POS is submitted must be completed before the term in which the student graduates. A transcript must then be submitted for review and final approval.

Research credits earned at another institution are generally not transferred. In rare circumstances, the transfer of S or P marks may be accepted for research credits only. It is the responsibility of the POS committee to obtain a letter from the responsible faculty member at the other institution stating that research credits recommended for transfer with S or P marks are considered to be worthy of a B grade or better.

Program of Study (Degree) Requirements

Each program consists of its own degree requirements. For a complete list of approved courses for each of the degree programs, please consult the appendices for the corresponding program.

Masters of Engineering in Mechanical Engineering

A course-work only master's degree that is well suited for working professionals and individuals seeking additional education beyond a bachelor's degree to become an outstanding engineer. Includes the following requirements:

Degree Requirement	Credits	Description
Mechanical Engineering Core	15	Any 500 or above level ME course as well as specific non-ME courses approved by the graduate committee. These courses are grouped according to disciplinary area emphasis to help student decide which courses to take based on interest. Please see approved courses (Appendix A)
Mathematics/Statistics	3	Any 300-level or higher Math or Statistics class (EXCEPT Math 307 and Math 317) will count towards this requirement. Non-Math/Stat courses with strong math or statistics content that are approved by the graduate education committee may also count towards this requirement. (Appendix B)
Professional Development	3	See list for approved courses. (Appendix D)
Electives	9	Choose any courses that you feel would round out your education; these can be from Mechanical Engineering or outside the major.
Total:	**30**	

Masters of Engineering in Energy Systems

A course-work only master's degree that allows practicing professionals the knowledge to deal with the increasing complexity of energy systems along with increasing environmental constraints. This program will provide additional education with the skills and abilities specific to energy system design, evaluation, construction and management. Includes the following requirements:

Degree Requirement	Credits	Description
Required courses	6	• ME 531: Advanced Energy Systems and Analysis (3 credits); offered on-line in fall semesters • ME 510: Energy Engineering Economics and Policy (3 credits); offered on-line in spring semesters
Math/Statistics	3	Any 400-level or higher Math or Statistics class or a class with significant math content from an approved list. (Appendix C)
Professional Development	3	Area of interest that meets the individual educational objectives of the student for professional development from an approved list. (Appendix D)
Elective Engineering courses	15	Courses in energy systems engineering from an approved list. Nine credits must be in a single focus area (biorenewables, wind, nuclear, power generation and distribution, building energy and energy efficiency, thermal science or as approved) (Appendix E)
Free elective	3	Any class from the above categories.
Total:	**30**	

Master of Science (Thesis)

Emphasizes graduate research and culminates in the creation of a thesis and associated oral defense. Includes the following requirements (*indicates available online)*:

Degree Requirement	Credits	Description
Mechanical Engineering Core	9	Any 500 or above level ME course as well as specific non-ME courses approved by the graduate committee. These courses are grouped according to disciplinary area emphasis to help student decide which courses to take based on interest. Please see approved courses (Appendix A)
Mathematics/Statistics	3	Any 300-level or higher Math or Statistics class (EXCEPT Math 307 and Math 317) will count towards this requirement. Non-Math/Stat courses with strong math or statistics content that are approved by the graduate education committee may also count towards this requirement. (Appendix B)
GR ST 565: Responsible Conduct of Research in Science and Engineering	1	Required Course
Electives	6	Choose any courses that you feel would round out your education; these can be from Mechanical Engineering or outside the major. Up to 6 credits of Independent Study (M E 590/690) may be included in the Program of Study. These 6 credits will by default count towards the elective requirements. As part of meeting their electives, students are encouraged to take at least one course that addresses skill sets aimed at professional development (e.g. teaching/research program

		building, project management, globalization, engineering law, communication etc.) for academia and/or industrial positions.
Research: ME 699	11	Required Course
Total:	**30**	

***Students must also meet ME 600 (Seminar) requirements in addition to the above*

PhD Degree

The degree culminates with the successful defense of a dissertation. A minimum of 72 graduate credits must be earned for the Ph.D. degree with the following requirements *(*indicates available online)*:

Degree Requirement	**Credits**	**Description**
Mechanical Engineering Core	15	Any 500 or above level ME course as well as specific non-ME courses approved by the graduate committee. These courses are grouped according to disciplinary area emphasis to help student decide which courses to take based on interest. Please see approved courses (Appendix A)
Mathematics/Statistics	6	Any 300-level or higher Math or Statistics class (EXCEPT Math 307 and Math 317) will count towards this requirement. Non-Math/Stat courses with strong math or statistics content that are approved by the graduate education committee may also count towards this requirement. (Appendix B)
GR ST 565: Responsible Conduct of Research in Science and Engineering	1	Required Course
Electives	18	Choose any courses that you feel would round out your education; these can be from Mechanical Engineering or outside the major. Up to 12 credits of Independent Study (M E 590/690) may be included in the Program of Study. These 12 credits will by default count towards the elective requirements. Students are encouraged to take at least one course that addresses skill sets aimed at professional development (e.g. teaching/research program building, project management, globalization, engineering law, communication etc.) for academia and/or industrial positions.
Research: ME 699	32	Required Course
Total:	**72**	

***Students must also meet ME 600 (Seminar) requirements in addition to the above*

M E 600 - Mechanical Engineering Seminar Series

A hallmark of leading institutions in science and engineering research is technical seminar participation. The department hosts a series of seminars throughout the academic year which includes invited speakers who are leaders in fields related to mechanical engineering. Attending seminars benefits scientific and engineering students by expanding their horizons, learning about research at other venues and at the forefronts of a field and also provides opportunities to learn about effective (and non-effective) presentation techniques.

All on-campus MS and PhD students pursuing a graduate degree in Mechanical Engineering are required to register for ME 600 every semester. This is a graduation requirement.

Course requirement details

1. Registered students must attend at least 4 technical on-campus seminars that are part of the Department of Mechanical Engineering Seminar Series (or co-sponsored by the Department of Mechanical Engineering). The graduate programs office will track this requirement. The course will be graded as satisfactory/unsatisfactory (fail). A fail will have adverse impact on your graduation.
2. This course will be a part of degree requirements for all graduate students as follows:
    a. **M.S. students**: Need to register every semester up to graduation. A student who is only registered for GR ST 680 is exempt from M E 600 for that semester.
    b. **Ph.D. students**: Need to register every semester until successful completion of preliminary examination.
    c. **New M.S. & Ph.D. students**: Need to register their first term in the specified section for new students and **must attend all Learning Community (MEGLC) meetings** in addition to the regular attendance requirement. Read more about this learning community below.
    d. **Students in interdisciplinary programs (e.g. HCI and BRT)**:
        i. Students who are also obtaining a degree from ME (i.e. co-majoring in ME) will be required to complete the ME 600 seminar requirement in addition to the seminar requirements of their program with the following modification: These students need to attend at least 3 seminars that are part of the Mechanical Engineering Seminar Series (or co-sponsored by the Department of Mechanical Engineering).
        ii. Students who only have ME as their home department (and are not obtaining an ME degree) will be exempt from the ME 600 seminar requirement.
    e. **Off-campus students and students pursuing Master of Engineering** are exempt from the seminar requirement.
3. Peer presentation: Students are encouraged to present but are not required to do so during MEGSO ME 600 seminars.
4. Conflict with seminar time: Students who have a conflict with the seminar time or meeting the requirement for a particular semester must still register for the course AND inform the DOGE within the first two weeks of the semester. Conflicts will be addressed on a case by case basis.

Mechanical Engineering Graduate Learning Community

The Mechanical Engineering Graduate Learning Community (MEGLC) was established in the spring semester of 2012. The MEGLC is open to all first-semester graduate students enrolled in the Department of Mechanical Engineering and is organized by MEGSO in conjunction with the Mechanical Engineering Graduate Programs Office. The MEGLC aims to meet the following four objectives:

1. Help students transition to the expectations and responsibilities of the Department of Mechanical Engineering Graduate Education Program from other programs, schools, and cultures
2. Develop critical professional skills including communication, research, and teaching skills
3. Offer an environment for first-year graduate students to socialize and develop student-student and student-faculty relationships
4. Promote an environment that welcomes and nurtures diversity

Current structure of the MEGLC consists of monthly lunch seminars during their first semester presented by senior-level graduate students, post-doctoral researchers, and guest speakers. Seminar topics include "Expectations of a Graduate Student," "Designing a Program of Study," "Individual Development Plan," and "How to Communicate in the World of Academia." These seminars will also help graduate students enhance professional skills through interactive involvement within seminars such as presentation of research. Additionally, the graduate students will have plenty of opportunity to advance networking skills through socializing with fellow graduate students and occasional faculty involvement. Attendance at the learning community seminars counts toward new students' ME 600 grades and is tracked through the Graduate Programs Office. Students who have a conflict with the seminar time must provide the Graduate program proper documentation to verify the conflict. Conflicts will be addressed on a case by case basis.

Ph.D. Qualifying Examinations

All Ph.D. students must pass a qualifying examination in order to pursue the Ph.D. degree. This examination must be taken by the end of the first year (August for Fall and Summer admits and January for Spring admits) in the program. The primary goal of the PhD Qualifier exam is to identify if you have the technical foundation to pursue a PhD and if possible, to identify weaknesses in your background that can be addressed. The format of the qualifying exam is decided by your major professor and POS committee. The most common format is a written exam on several topics with associated reading material that is based on core mechanical engineering subjects at the senior undergraduate or introductory graduate level.

It is the student's responsibility to check with your major professor on format and scheduling of the exam. Once you have fixed a date, fill out the Qualifier Blank Form. Your performance in the exam is judged as Pass, Conditional Pass, or Fail. In the case of Conditional Pass, you are given some set of conditions to complete. This can include taking a class on a topic. In the case of a Fail, the committee will make a recommendation if you are allowed to take the exam again or asked to end your PhD program.

Ph.D. Preliminary Oral Examination

A student becomes a Candidate for the Doctor of Philosophy degree after successful completion of the Preliminary Examination. This is an oral examination conducted by the student's POS Committee; it is intended to assess whether or not the student: has met doctoral-level standards for general knowledge in mechanical engineering, in supporting subject areas, and particularly in the student's area of expertise; has developed the capabilities or facilities needed to complete his or her research project; and can demonstrate the ability to use such knowledge and to orally communicate it to others. A written research proposal, prepared by the student should be given to the committee at least a week in advance of the examination. The proposal should present the significance of the problem and the objectives of the research, a review of the present state of knowledge in the area, a description of the research plan, results to date, and plans for completing the project. The format for this proposal may be similar to that used for the final dissertation.

A minimum of 6 months must lapse between a student's Prelim Oral and their final oral. At least 2 weeks before the date of the Preliminary Examination, the student must submit the Request for Preliminary Examination Online Form to the Graduate College. This is an online form, available on the Graduate College's website. Following successful completion of the Preliminary Examination, the student is formally admitted to candidacy for the Doctor of Philosophy degree.

A preliminary oral examination will not be scheduled for a student on provisional or restricted admission or on academic probation. Upon successful completion of the preliminary oral examination, the student is admitted to candidacy for the Ph.D. degree. If the graduate student fails all or part of the preliminary oral examination, he/she may be allowed to retake it. Six months must elapse between the first attempt and the next.

The entire POS committee must be convened for the preliminary oral examination. Any request to change the makeup of the committee needs to be submitted in writing on the "Request to Change Committee Appointment" form to the Graduate College and approved by the Dean of the Graduate College **before** the preliminary oral examination is held. The request must be signed by the student, all committee members involved in the change, and the DOGE.

In some cases, it may only be possible to convene the committee in a timely manner if **one of the committee members** participates at a distance. This is permitted if the distance participation is agreeable to all committee members, if the mode of communication permits the full participation of the **committee member** at a distance, and if the Graduate College is **notified in advance** by submitting the form "Preliminary or Final Oral Examination with Committee Member at a Distance", which is available at the Graduate College's website. The preferred method of distance participation is video conferencing, but speaker phone is acceptable in cases where visual presentation is not critical. The distant committee member must participate for the entire examination.

The preliminary oral examination must be passed at least six months prior to the final oral examination. In rare circumstances, an exception to the rule is allowed if a written request with extenuating circumstances signed by the major professor(s) and the program's DOGE is submitted and approved by the Dean of the Graduate College.

Immediately following the preliminary oral examination, it is the responsibility of the POS committee to decide whether the student will be recommended for admission to candidacy and may continue to work toward the Ph.D. degree. All POS committee members must be present at the preliminary oral and sign the report form.

In a preliminary oral examination, if one member of the committee votes not to pass the candidate, the student passes, but each member of the committee must forward to the Dean of the Graduate College in writing a justification for his/her vote. Upon request these letters will be made available to the committee at the time of the final oral examination. If more than one member of the committee votes not to pass the student, the candidate does not pass the examination. An explanatory letter must accompany the report form.

Changing Degree Tracks

Changing degree tracks, including changing between Master degree options, typically requires the approval of your major professor and the Director of Graduate Education as well as appropriate paperwork. If you are considering a change in degree track, please contact the Graduate Programs Office to learn about exact procedures for your case.

Online Learning Students

All the policies and procedures for the graduate program apply to students in the online learning program. The Engineering/LAS Online Learning staff and our Grad Programs Staff will be happy to assist you in preparing and routing forms for signatures.

Default major professor

A default major professor, usually the Director of Graduate Education, is established for the convenience of distance students who are pursuing the coursework only Master of Engineering Degree. You are free to choose another faculty member.

Failure to Maintain Academic Standing

Graduate students are expected to maintain a cumulative 3.00 grade point average on all coursework taken, exclusive of research credit. The Mechanical Engineering graduate program's policy for maintaining good academic standing is outlined below. The policies are in line with the Graduate College's policy.

Probation

New, first term, degree-seeking graduate students who fall below a 3.00 GPA at the end of their first semester at Iowa State University will be given a one term grace period to bring their grades back to a 3.00 GPA. Students may receive a warning letter from the Graduate College. While on academic probation a student will not be admitted to candidacy for a degree and if appointed to a graduate assistantship, the student will not receive a Graduate College tuition scholarship.

To insure that registration does not take place without a review by faculty in the program, the Graduate College places a hold on future registrations by a student on probation. Before a student on probation registers for each term, there must be a review of his or her record and the DOGE must recommend whether the Graduate College should permit further registration.

Before graduation is approved by the Graduate College, the student must complete all courses listed on the program of study with a minimum grade of C and have achieved a 3.00 GPA or greater. Exceptions must be recommended in writing by the student's POS committee and DOGE and approved by the Dean of the Graduate College. Probationary status for more than two years is grounds for dismissal for failure to maintain academic standing.

Graduate Minor in other disciplines

Students pursuing a mechanical engineering graduate degree may also pursue a minor in any discipline that has approved to grant a graduate degree. Pursuing a minor may be advantageous for students working on interdisciplinary projects with a particular emphasis on another specific discipline. A student may not minor and major in the same field. In all cases:

- the student must receive approval from and meet the minimum requirements established by the program offering the minor,
- a graduate minor must be comprised of graduate or undergraduate courses designated as appropriate by the program offering the minor,
- the student must have a minor representative on the POS committee,

- on that committee, the major professor and the representative from the minor field may not be the same person, and
- a minor must be approved by the POS committee, declared on the POS, and listed on all examination reports and the "Application for Graduation" form in order to be eligible to appear on a student's transcript after graduation.
- a minor cannot be added to a degree that has already been received.
    - For a master's degree: A graduate faculty member from the minor program must serve on the POS committee and the final oral examination must test for the minor.
    - For a Ph.D.: A graduate faculty member from the minor program must serve on the POS committee; the preliminary oral and final oral examinations must test for the minor. A minor cannot be added to a program of study after the preliminary oral examination is taken.

Graduate Minor in Mechanical Engineering

Students pursuing graduate degree in other discipline may pursue a minor in mechanical engineering. On completion of the following requirements, their degree certificate will state the minor in mechanical engineering.
General requirements: To obtain a graduate minor in mechanical engineering, students must

- Have a ME faculty as the minor representative on the POS committee
- Student pursuing a masters' degree should complete three courses for ME core course list with at least one course from ME Department
- Students pursuing a PhD degree should complete four graduate-level ME courses.
    - For Ph.D. students, all minor requirements must be completed before taking the preliminary examination.

Special Graduate Majors and Degree Programs

Opportunities also exist for majoring in more than one area of study (co-major, concurrent major or double degree). Please consult with the Graduate College Handbook for detailed requirements. It is an expectation that students will discuss such options in consultations with their major professor.

Co-Major

A co-major is a program of study for a single degree in which the requirements for two separate majors are met. A single degree is granted when the student fulfills the requirements of both majors. The program of study (POS) committee will include co-chairs, each of whom represents one of the co-majors. Both co-chairs must be members of the graduate faculty. The same person, if a faculty member in both majors, will be allowed to serve as major professor for both majors. A preliminary oral examination and research work for the Ph.D. degree should be related to both majors. Students declaring co-majors must satisfy requirements established by each major as monitored by the representatives on the program of study (POS) committee and the DOGEs of the two majors. A co-major cannot be added after the preliminary oral examination has been taken.

Concurrent

Graduate in Concurrent Undergraduate: Graduate students interested in enrolling in a concurrent undergraduate program should contact the Office of Admissions (100 Enrollment Services Center) to obtain admission information (even if previously admitted as an undergraduate). An "Application for a Graduate Student Wishing to Pursue a Concurrent Undergraduate Degree" form can be obtained from the Graduate College Web site at http://www.grad-college.iastate.edu/common/forms/index.php and circulated for the appropriate signatures. The process is detailed below:

- Complete the undergraduate application process. Applications are available at http://www.admissions.iastate.edu.
- The student must be formally admitted both as a graduate student and as an undergraduate student.
- Official enrollment and fee payment will be as a graduate student.
- Credits transferred from the graduate permanent record to the undergraduate permanent record are no longer available for use on a graduate program of study.

- Students in concurrent degree programs may, subject to Program of Study committee approval, double count up to 6 ISU credits for both a bachelor's degree and a certificate or master's degree.

Undergraduate in Concurrent Graduate Programs: The minimum requirements for admission to the concurrent program are generally the same as those required for full admission to the Graduate College. (Also, since these students have not received their undergraduate degrees, they must be making good progress toward a bachelor's degree.) An "Application for an ISU Undergraduate Student Wishing to Pursue a Concurrent Graduate Certificate or Graduate Degree" form can be obtained from the Graduate College Web site at http://www.grad-college.iastate.edu/common/forms/index.php and circulated for the appropriate signatures. Other requirements include:

- Official enrollment and fee payment will be as a graduate student.
- The graduate degree or graduate certificate will be awarded only at the same time as, or after, the undergraduate degree is conferred.
- Students interested in a research career may be able to apply for graduate research assistantships while in a concurrent degree or graduate certificate program.
- Students in concurrent degree programs may, subject to Program of Study committee approval, double count up to 6 ISU credits for both a bachelor's degree and a certificate or master's degree.
- For students pursuing a concurrent undergraduate bachelor's degree and graduate certificate, at least 12 graduate credits cannot be double counted and a maximum of 6 graduate credits can be double counted for both the bachelor's degree and the graduate certificate (when the graduate certificate requires more than 12 credits).
- A student in a bachelor's and master's concurrent degree program cannot be on a Ph.D. track during the concurrent program.

Double Degree

A double degree requires fulfillment of the requirements for two graduate majors for which two differently named master's degrees and two diplomas are granted at the same time. For double degrees, the final project (thesis or creative component) must integrate subject areas from both departments. Students should reference the graduate college handbook for proper procedure.

Engineering Internship

Graduate students may go on internships or co-operative education jobs (also called Curricular Practical Training or CPT) during the summer of any other semester during their degree program. This is generally done after consulting with the major professor. Prior to going on internships or Co-ops, students MUST register for M *E 697: Engineering Internship* and submit the M E 697 Internship approval form (available online at http://www.me.iastate.edu/graduate-program/degrees-and-programs/forms/) to the Graduate Programs Office. In order for us to submit a grade, after your internship, you are required to submit a 1 page summary of the work experience to the DOGE with a copy to the support staff. You must include details on WHERE you did the internship including names of supervisory personnel, WHAT DATES you were at the internship, a DESCRIPTION of activities performed and a statement on how this experience benefited you.

Please keep in mind the following regulations regarding internships

- Internship positions equal any work related to a student's major area of study for one semester and one summer maximum per academic year professional work period.
- You will need to complete an add/drop slip to register for M E 697.
- You may generally not hold an assistantship for longer than five days into the term that you will be gone on internship.
- While away from campus, please make arrangements for someone to pick up your mail at your campus mailbox. First class mail can be forwarded to you upon your request. Please notify the graduate programs staff if you would like first class mail forwarded.

- International students must meet with an International Students and Scholars (ISS) counselor regarding curricular practical training (CPT). If extending your internship, you must discuss ramifications with ISS before completing the M E 697 form.
- After your internship, you are required to submit a 1 page summary of the work experience to the Grad Programs Office. Describe responsibilities and activities performed and a brief description of how the experience helped your professional development.

Professional Ethics and Academic Integrity

Graduate students are expected to comply with the Faculty Statement on Professional Ethics (see Faculty Handbook, Section 7.2).It is imperative that every student understands the ethical standards of engineering science and conduct his or her scholarly activities accordingly. Scientists and engineers, who commit unethical acts, whether from carelessness, ignorance, or malice, quickly lose the respect of the scientific community. Scientific misconduct includes such activities as:

- Falsification of data, ranging from fabrication to deceptively selective reporting, including the purposeful omission of conflicting data with the intent to falsify results
- Plagiarism: representation of another's work as one's own
- Misappropriate of the ideas of others: unauthorized use of privileged information
- Misappropriation of funds or resources for personal gain
- Falsification of one's credentials

In addition to scientific misconduct, graduate students are held accountable to the academic dishonesty policy. Academic dishonesty occurs when a student uses or attempts to use unauthorized information in the taking of an exam; or submits as his or her own work themes, reports, drawings, laboratory notes, or other products prepared by another person; or knowingly assists another student in such acts. Such behavior is abhorrent to the university, and students found guilty of academic dishonesty face suspension, conduct probation, or written reprimand. Instances of academic dishonesty ultimately affect all students and the entire university community by degrading the value of diplomas when some are obtained dishonestly and by lowering the grades of students working honestly. Examples of specific acts of academic dishonesty include, but are not limited to the following:

- Obtaining Unauthorized Information. Information is obtained dishonestly, for example, by copying graded homework assignments from another student, by working with another student on a take-home test or homework when not specifically permitted to do so by the instructor, by looking at one's notes or other written work during an examination when not specifically permitted to do so.
- Tendering of Information. Students may not give or sell their work to another person who plans to submit it as his or her own. This includes giving their work to another student to be copied, giving someone answers to exam questions during an exam, taking an exam and discussing its contents with students who will be taking the same exam, or giving or selling a term paper to another student.
- Misrepresentation. Students misrepresent their work by handing in the work of someone else. The following are examples: purchasing a paper from a term paper service; reproducing another person's paper (even with modifications) and submitting it as their own; having another student do their computer program; or having someone else take their exam.
- Bribery. Offering money or any item or service to a faculty member or any other person to gain academic advantage for oneself or for another is dishonest.
- Plagiarism. Unacknowledged use of information, ideas, or phrasing of other writers is an offense comparable with theft and fraud, and it is so recognized by the copyright and patent laws. Literary offenses of this kind are known as plagiarism.

At ISU, these acts are taken very seriously and constitute "academic misconduct". Individuals found guilty of academic misconduct may suffer a variety of penalties up to and including expulsion from the university. Academic dishonesty is considered a violation of the behavior expected of a student in an academic setting as well as a student conduct violation. A student found guilty of academic dishonesty is therefore subject to appropriate academic penalty, to be determined by the instructor of the course, as well as to penalty under the university student conduct regulations.

If a graduate student is accused of academic dishonesty relating to conduct of a sponsored research project, the matter will be handled in accordance with the university's "Policy on Academic Misconduct" (see Faculty Handbook, Section 7.2.2.3). In issues regarding conduct of research, graduate students are held to the same standards as faculty. Otherwise, the matter will be handled in accordance with the processes under the "Academic Life" section of the ISU Catalog.

If a student is aware of a potentially unethical situation, he or she should seek the advice of a trusted professor. Students may also contact the Director of Graduate Education (DOGE). All such discussions with the DOGE are considered and treated as confidential. It is very important to protect the rights of the individual whose actions are questioned. Frivolous accusations of misconduct and vicious spreading of rumors are just as unethical as fabrication of data or plagiarism.

General Expectations as a Graduate Student

You are being given the responsibility to develop your educational program to best meet your career and educational goals. Many of us are here to help you in this process, but we expect you to take the lead in your education. We expect that you will:

- work independently and responsibly in your area of research and show initiative
- ensure expectations between you and your major professor are clear through constant and clear communication
- broaden and enrich your education by attending talks and seminars in the department and on campus
- be aware of degree and assistantship requirements and deadlines and file paperwork in a timely manner
- represent yourself and the program with highest standards of integrity, ethics and professionalism

Completion of Program

Before graduation, MS and PhD students must prepare a thesis or dissertation. The student and major professor must determine whether or not the results are to be published and what the student's responsibilities are in the publication process. Excellence in research is best exemplified in the form of publishable research and/or patent applications. It is normally expected that the student will at least complete the draft of one or more research (journal) papers prior to graduation. Besides thesis and research paper preparation, the student has other responsibilities.

The laboratory and office space occupied by the student should be left clean, with all equipment left or returned to storage in good condition. The student and major professor will decide to what degree experimental apparatus will be disassembled.

Keys are to be returned to the General Services Building. Any Marlock key or Locknetics key needs to be returned to the Media Center, 2079 Black.

If termination is at some other time than the end of an appointment period, notice of resignation must be sent to the Graduate Programs Office, with approval from their major professor.

Application for Graduation

Application for graduation should be made by the end of the third week of the semester in which the student expects to receive the degree. To apply for graduation, the student is required to log into their AccessPlus account and submit the electronic Application for Graduation form. Before submitting this form, a student must have submitted and had approved by the Graduate College a "Recommendation for Committee Appointment" form and a "Program of Study" form. Also the student must have been fully admitted to a program and met the Graduate English requirement (for nonnative English speakers). Graduation will be delayed if the "Application for Graduation" form filing deadline is not met. If it becomes apparent that a student cannot graduate during the indicated term, he/she should withdraw the application through AccessPlus. The student must then submit a new application for the next planned term of graduation. Upon submitting the application for graduation, all thesis students will be charged a one-time, nonrefundable $145 thesis fee by the Graduate College. This fee will be billed to each thesis student's university bill to cover thesis review and processing, thesis technical assistance, and printing and binding fees for the ISU library copy.

Thesis or Dissertation Preparation

Theses and dissertations are prepared electronically according to the *Graduate College Thesis Manual*, available on-line at: http://www.grad-college.iastate.edu/current/thesis/. Students need to electronically submit to the ME Graduate Programs Office (DOGE) one electronic copy of their final thesis/dissertation prior to or along with submitting a Thesis/Dissertation Submission Form. Please consult with your major professor as to other copies that he/she may require you to submit.

Final Examination

As a part of the Final Oral Examination procedure, candidates for the M.S. or Ph.D. degree are expected to give a seminar to present and defend their research dissertation. This Examination consists of a one-hour general presentation in a public seminar, followed immediately by a detailed examination by the candidate's POS Committee.

The M.S. or Ph.D. student must submit the Request for Final Examination Online Form to the Graduate College Office **at least three weeks before the examination**. This form is available on the Graduate College's website. The Graduate College must approve changes in the membership of the Program of Study Committee before the Final Examination occurs.

Graduate students must register at Iowa State University for the equivalent of one credit, or for the R-credit course GR ST 680B (Examination Only) if no course work is needed, during the semester in which the final oral examination is taken. Taking only an R-credit course where the fee is not equivalent to the 1-credit minimum charge is not acceptable for the term of the final oral examination. If the examination is taken during the interim between terms (including the first day of classes), registration can be for either the term before or the term after the examination is held. International students, even those in their final term, must be registered full-time or previously approved by the International Students and Scholars (ISS) to reduce their course load.

The entire POS committee must be convened for the final oral examination. Any request to change the makeup of the committee needs to be submitted in writing to the Graduate College and approved by the Dean of the Graduate College before the final oral examination is held. The request must be signed by the student, all committee members involved in the change, and the DOGE. With the approval of the major professor and concurrence of the candidate, interested faculty members and graduate students may attend final oral examinations and, at the invitation of the major professor, may ask questions.

In some cases, it may only be possible to convene the committee in a timely manner if **one of the committee members** participates at a distance. This is permitted if the distance participation is agreeable to all committee members, if the mode of communication permits the full participation of the **committee member** at a distance, and if the Graduate College is **notified before scheduling the examination** by submitting the form "Preliminary or Final Oral Examination with Committee Member at a Distance", which is available at the Graduate College's web site. The preferred method of distance participation is video conferencing, but speaker phone is acceptable in cases where visual presentation is not critical. The distant committee member must participate for the entire examination.

Under rare circumstances, a graduate student may participate in his/her final oral examination at a distance. In the case of master's students, the Graduate College must be notified in advance of the examination in writing, with written approval of the major professor, the POS committee, and the program's DOGE. In the case of doctoral students, permission must be requested from the Graduate College, and the request must include a justification explaining the unusual circumstances that necessitate defense at a distance, approval of the major professor, the POS committee, and the program's DOGE. Whenever a student defends at a distance, the entire POS committee is expected to be on campus and available at a single location to facilitate the formulation of an objective evaluation. Technical capability for real-time visual and spoken communication must be established. Graduate programs may establish a student fee for technical costs associated with videoconferencing. It is an expectation that students will participate in person. Only in rare circumstances will a student be allowed to participate at a distance due circumstances that involve an inability to travel (providing proper documentation) such as:

- International visa issues
- Serious health concerns
- Military service
- Legal reasons

Graduation Student Approval Form

After the Final (oral) Exam, the student must complete a Graduation Student Approval Form. Individuals from various offices sign this form to indicate that the student has completed the degree requirements and has met all other obligations to be eligible for the degree. The Graduate College will send this form along with their final oral forms to a student's major professor.

Check-Out Procedure

Each graduate student must arrange a check-out procedure within his or her group as established by the major professor. Students employed by other centers, institutes, or laboratories within the university must also comply with their check-out procedures.

Students should also return all keys issued to them. In addition, students who were issued a purchasing card (see General Information section) must return the card to the main office (2025 Black).

Employment

Prior to graduation and departure, most students will be seeking employment. Employer representatives visit campus all during the year, but the prime interviewing season begins at the end of September and continues into January and February. Students should visit the Engineering Career Services Office for further information.

Many companies offer interview trips to prospective employees. Students should check with their major professor and supervisor (if a teaching assistant) before going on interview trips.

Outstanding Graduate Student Awards

Research and Teaching Excellence Awards

The Graduate College and the Department of Mechanical Engineering sponsor two awards to graduate students for outstanding achievement in research and teaching:

Nomination Deadlines

Students self-nominate for these awards. The Graduate Committee reviews all nominees' application materials and selects the recipients.

Students will receive notification by email regarding the exact deadline to self-nominate; however, nominations are typically due to the ME graduate programs office as indicated below:

Fall Semester	November
Spring Semester	March

Research Excellence Award

The purpose of these highly competitive awards is to recognize outgoing graduate students for outstanding research accomplishments as documented in resulting peer-reviewed publications, theses and dissertations. These students are also expected to be academically superior and able to not only do research, but develop a well-written product. The program is administered by the Graduate College with additional administrative support from the Graduate Student Senate. Awards are offered each semester and summer session, depending on departmental allocations and prior awards.

Each Research Excellence Award will consist of a letter of commendation from the ISU President, a certificate of achievement from the Dean of the Graduate College, and cords to be worn during the graduation ceremony. Recipients will be recognized in the ISU Commencement Program; documentation will also be made on each student's transcript. Each term a formal photograph will be taken of recipients with the ISU President, the Provost and/or the Dean of the Graduate College. This photograph will appear in *Research and Graduate Education* along with an accompanying article.

Teaching Excellence Award

The purpose of these awards is to recognize and encourage outstanding achievement by graduate students in teaching. The program is administered by the Graduate College with additional support from the Graduate Student Senate.

Each Teaching Excellence Award will consist of a letter of commendation from the ISU President, a certificate of achievement from the Dean of the Graduate College and cords to be worn during the graduation ceremony. Recipients will be recognized at the time of graduation – each will be given an honor cord, cited in the ISU Commencement Program and recognized during the ceremony. Documentation will be made on the student's transcript. Each term a formal photograph will be taken of recipients with the ISU President, the Provost and/or the Dean of the Graduate College. This photograph will appear in *Research and Graduate Education* along with an accompanying article.

Zaffarano Prize for Graduate Student Research

Award deadlines

Nominations are due March 1, to zaffaran@iastate.edu, Graduate College, 1137 Pearson Hall. Winners are notified mid-April and presented the award at the annual Sigma Xi banquet in April. The Graduate College in conjunction with Sigma Xi presents and at the bequest of Dr. Daniel Zaffarano (Vice President for Research and Dean of the Graduate College at Iowa State University from 1971-1988) present this annual to recognize superior performance in publishable research by an ISU graduate Student. A check for $1,500 and a plaque will be presented to the winner. For the purpose of this award, publishable research is defined as work written and accepted for publication in a national or international refereed journal. Both the quality and the number of publications produced during the student's time at ISU will be considered. The awardees must either be currently enrolled at ISU for the Spring semester of the nomination, or have graduated in the 2 preceding semesters. In all cases he or she must be available to receive the award in person.

Nomination procedure

Major professors and faculty make nominations to the Dean of the Graduate College by March 1. Each nomination should include a professional resume with copies or reprints of all publications authored by the student while enrolled at ISU. When the student is not the senior author, a note of explanation by the major professor or coauthor describing the student contributions to the published work is needed. The nomination should also include a letter from the student's major professor and an endorsement from either the departmental chair or the director of graduate education (DOGE).

The Karas Award for Outstanding Dissertation

The Karas Award for Outstanding Dissertation has been established to recognize excellence in doctoral research at Iowa State University. Each year the two winners of this award become Iowa State University's nominees to the national competition for the Council of Graduate Schools (CGS)/University Microfilms International (UMI) Distinguished Dissertation Award. Awards are selected annually in two of the rotating four broad disciplinary areas announced by the Council of Graduate Schools. The deadline for the Karas Award competition is March 1, and the award amount will be $1,000 for each dissertation award winner. Award winners are expected to be available to receive the award in person.

The date of the degree awarded, or the completion of doctoral degree requirements and dissertation, must fall within a two year timeframe of the award (e.g., for students providing a dissertation for the 2014 competition, the degree must have been awarded in the period from July 1, 2012 to June 30, 2014.) For students graduating after March 1, 2014, the dissertation must have been cleared through the Graduate College for submission to University Microfilms/Proquest prior to March 1. (If that student wins the award but does not meet all degree requirements before June 30, he/she must forfeit the award.) For more information please visit: http://www.grad-college.iastate.edu/academics/awards/karas.php

General Information

Office space

If available, office space is assigned by the department's space coordinators and must be requested on behalf of a student by their major professor. Laboratory space is the responsibility of your major professor.

Each graduate student is responsible for maintaining a neat and safe environment in the assigned office and laboratory as per campus regulations. Safety and housekeeping inspections are held frequently by the department safety officer and violations are dealt with severely.

Keys

Key request forms are available in the main department office (2025 Black). The department secretary will assist you in filling the form and ordering your keys. Keys are issued to students for three, six or twelve months. If keys are required beyond the due date, a renewal key request may be submitted. Key authorization forms can be obtained from the Departmental Office, and then taken to the General Services Building where keys are issued. For entrance to the building and instructional labs (for TAs) please go to the Media Center in 2079 Black. Graduate students needing to switch keys with another graduate student should stop in 2025 Black and fill out a Transfer of Key Form. Any lost or stolen keys can be replaced for a fee.

Mail

Graduate students have mailboxes grouped by their major professors in 2019 Black. Personal mail should **NOT** be delivered to the department nor should personal outgoing mail be mailed from the department office.

Telephones

Local telephone calls, i.e. within Ames, may be made from the office telephones in Black. Dial 8 to get an outside line. ISU phone numbers (those with a 294, 296 or 572 prefix) may be reached by dialing the last number of the prefix and the last four digits. Long distance calls for research and professional purposes, such as university business, may be made from your office phone using an access code that you may obtain from your major professor, with permission.

Office Hours

The ME main office, 2025 Black, is open from 8:00 a.m. to 11:50a.m. and 1:10p.m. to 5:00 p.m. The telephone number is 515/294-1423; the fax number is 515/294-3261. Administrative offices on campus are also open during these hours. The ME Graduate Programs Office, 2019 Black, is open from 8 a.m. to 12:00 p.m. and 12:45 p.m. to 4:30p.m. The telephone number is 515/294-0838. Summer hours for department offices may change to 7:30 a.m. to 4:00 p.m.

Copiers

The copy machine in the Faculty Commons, 2013 Black, may be used for teaching or research-related material approved by your major professor; **they should not be used for personal use**. The copiers at the Library may be used for personal copying. **Students should use the copy centers on campus for copies of theses and dissertations.**

Purchase of Equipment and Supplies

The student must secure permission from their major professor before making any purchase. Additional required information includes the department account to charge the purchase to and a detailed business purpose (what you are buying and how it will be used.) There are resources on campus to obtain supplies for research including Central Stores and Chemistry Stores or online through CyBuy. A wide variety of items may be ordered online with contracted vendors through CyBuy on the uBusiness tab in AccessPlus (i.e. Fisher Scientific, Grainger, OfficeMax, Sigma-Aldrich or VWR International.) Contact the main office for purchases outside the university.

Graduate students are responsible for their own office supplies. There are often old file folders available for student use from the main office if needed (see the secretary in 2025). Supplies for teaching purposes (for Teaching Assistants) can be obtained from the main office.

Other Services

The College of Engineering and other university centers or laboratories offer a variety of services to aid the graduate students. These include shops for construction of equipment and analytical laboratories. Arrangements for using these services must be discussed with the student's major professor.

Absences from Campus

Arrangement for a leave of absence is made between the graduate assistant and that assistant's supervisor adhering to all grant and other funding source restrictions. When a graduate assistant needs to be absent either for personal reasons or illness, the supervisor should be understanding and accommodating to that need. At the same time, the graduate assistant should attempt to plan personal leave so that it does not interfere with or cause neglect of the duties associated with his or her appointment. Supervisors of graduate assistants are responsible for ensuring that their assistants do not exceed reasonable limits for leave.

Job Postings

Job postings are available on ISU CMS through the Engineering Career Services Office and posted on a bulletin board located opposite 2004 Black. This board also has faculty and post-doctoral opportunities as well. Graduate students are encouraged to sign up for career assistance on the 4th floor of the Memorial Union.

ME Graduate Student Organization (MEGSO)

The ME Graduate Student Organization (MEGSO) was founded for the purpose of promoting interaction among the students of the department. The organization strives to create a friendly working atmosphere between students and faculty. MEGSO also promotes professional activities and interacts with faculty candidates.

Events during the year such as picnics, potluck dinners, bowling and field trips provide an excellent way for MEGSO members to interact in a social setting. MEGSO members show prospective graduate students around the campus and city during visits. Enrollment is currently limited to ME graduate students, although members are encouraged to bring guests to the functions. To participate in MEGSO, simply watch for an announcement as to when and where the meeting will be held. MEGSO also hosts a mandatory learning community for all new first year ME students.

2017-2018 MEGSO Officers:

Position	**Officer**	**Email**
Adviser	Abhijit Chandra	achandra@iastate.edu
Adviser	Hallie Golay	clemens@iastate.edu
President	Tina Akinyi	takinyi@iastate.edu
Vice President	Nelson Wiese	wiesen1@iastate.edu
Treasurer	Joel Braden	jbraden@iastate.edu
Fundraising Coordinator	Tariq Mahbub	tmahbub@iastate.edu
Learning Community Coordinator	Marilyn McNamara	mcm@iastate.edu
University Relations/Legislative Affairs	Emily Johnson	johnsel@iastate.edu
University Relations/Legislative Affairs	Meghana Akella	makella@iastate.edu
Events Coordinator	Anthony Locurto	alocurto@iastate.edu

Conference and Research-related Travel

For students planning on attending a conference, some (if not all) of the following information will apply to you so please read carefully.

Travel Related Expenses

Before going on travel, please stop into the main office to discuss what travel expenses can and cannot be reimbursed.

Travel Professional Advancement Grant (PAG)

Travel Professional Advancement Grant (PAG) forms are filled out by the grad student to request funding from the Graduate and Professional Student Senate (GPSS) to help support your trip expenses. Each graduate student is eligible to receive one Travel PAG per fiscal year (July 1 through June 30 – NO EXCEPTIONS). For more information please see the "PAG Funding" section on the GPSS website at http://www.gpss.iastate.edu/students/pag/.

Procedures for attending a conference are:

1. Check with your major professor regarding the conference you wish to attend. Obtain his or her approval before proceeding with the next step.
2. Fill out the ME Student Travel Form and turn it into Neely in 2025 Black Engineering
3. Fill out the PAG application.
4. Once the appropriate departments have reviewed the PAG, a copy will be returned to you indicating the amount of support for which you are eligible.

All forms mentioned above are located in the University Forms file in main office. Additional information about graduate studies at Iowa State University may be obtained from the Graduate College Website (http://www.grad-college.iastate.edu).

Mediation of Student Disputes and Grievances

When graduate students become involved in disputes with their mentors that cannot be resolved by direct communication, the Graduate Programs Office will serve as informal or formal mediator depending on the particular circumstances. Students should feel free to contact the DOGE should such disputes. All such conversations are strictly confidential and the DOGE will work with the student to help resolve the dispute. Several formal avenues of appeal are available to graduate students to handle grievances concerning grades and instruction and for grievances related to scholarly and professional competence. All procedures start at the department or program level and lead through a series of steps to higher appeal channels. All such grievance procedures must be initiated within 3 weeks after end of semester during which the alleged grievance occurred. The Mechanical Engineering's grievance procedure is outlined below. Information for appeals at higher levels can be found in the Graduate College Handbook.

Grievances about Grades and Instruction

Grievances arising out of classroom or other academic situations should be resolved, if at all possible, with the individual instructor involved. If resolution cannot be reached, the student should discuss the grievance with the instructor's department executive officer (chair) and submit it in writing to him or her. The department executive officer will discuss the grievance with the instructor involved and/or refer it to a department grievance committee. The department executive officer should respond in writing to the student within five class days.

Grievances Related to Scholarly and Professional Competence

Judgment of professional competence as demonstrated in such matters as qualifying, preliminary and final oral examinations, and other clearly stated program requirements concerning competence in the field of study is the responsibility of the academic program and Program of Study (POS) committee.

If a student feels that his or her scholarly or professional competence has not been evaluated fairly, he/she should first discuss the complaint with the person or persons most directly involved in the matter: a faculty member, major professor, POS committee, director of graduate education (DOGE), or department chair. If these discussions are unsuccessful and further adjudication is desired, the student may request (in writing) that the grievance be handled by the department grievance committee.

Department grievance committee

The DOGE shall appoint a grievance committee to handle student grievances. The committee will comprise of equal representation from faculty and graduate students. The DOGE will serve as a non-voting member of the committee. The committee shall review the grievance and present its recommendation in writing

to the DOGE within one week after all necessary information is provided to them. The DOGE will then provide a written response to the student.

Forms and Deadlines

General procedure for forms

It is your responsibility to fill out your forms and get signatures from your major professor first and then from your POS committee members (when necessary). Attach any required additional materials and submit the form to the ME Grad Programs Office Staff. Do not submit it directly to the DOGE. The staff will verify all information and obtain the DOGE's signature. If information on the form needs to be clarified or changed, you will be contacted. If the form is approved and signed by the DOGE, the graduate programs staff will inform you when the form is ready to be picked up.

Deadlines

Please take note of the deadlines associated with the various forms in the table below. Note that these deadlines pertain to receipt of the completed form at the Graduate College. Please plan to allow two days or so for processing and submit accordingly. Please treat the deadlines seriously. Failure to comply can and will result in delays to graduation, degree progress and registration holds.

Form	Deadline	Form available at
POS Committee Program of Study	By the end of second semester in program	Grad College Forms Website
ME 590/690 Independent Study Approval form	Prior to registering for ME 590/690 course	ME Grad Program Forms Website
PhD Qualifier Exam Result and Report	Before end of 1st year in degree	
POS Modification	Before submitting request for final oral exam	Grad College Forms Website
POS Committee Change Form	Before filing request for PhD Prelim Exam	Grad College Forms Website
Request PhD Preliminary Exam	3 Weeks Before Exam Exam should typically be taken at the end of the second year in PhD program	ME Graduate Programs Office
Request for Final Oral Exam	3 Weeks Before Exam Exam is during final semester	Grad College Forms Website
Application for Graduation Form	Friday of the first week of classes for fall and spring semester; last day of spring semester classes for summer graduation	Grad College Forms Website
Request to Continue on for a PhD	Semester Graduating with MS and after final Oral Exam for MS	Grad College Forms Website
ME 697: Engineering Internship Approval Form	Prior to registering for ME 697 and departing for internship	ME Grad Program Forms Website
Travel authorization	Two-three weeks prior to conference departure	
Professional Advancement Grant Application	Two-three weeks prior to conference departure	http://www.gpss.iastate.edu/
Thesis/Dissertation Approval Form	Prior to thesis submission deadline, generally two weeks before end of semester	http://www.grad-college.iastate.edu/current/thesis/

Electronic copy of thesis to ISU and DOGE	Generally two weeks before end of semester	N/A
Graduation Approval Form		Grad College Forms Website

Graduate College 2016 – 2017 Graduation Deadlines

Fall 2017, Spring 2018, Summer 2018 Graduate College Graduation Deadlines

Master's Coursework Only	Master's Non-thesis	Master's Thesis	Ph.D.	Students are encouraged to complete the items below as early in the semester as possible. *http://www.grad-college.iastate.edu/common/forms/student_forms.php	Fall 2017	Spring 2018	Summer 2018
			x	**COMMITTEE/PROGRAM OF STUDY FORM** needs to be approved by the end of the semester before preliminary exam. Recommended: second semester of graduate program.	Aug 4	Dec 15	May 4
x	x	x		**COMMITTEE/PROGRAM OF STUDY FORM** needs to be approved by the end of the semester before graduation.	Aug 4	Dec 15	May 4
x	x	x	x	**APPLICATION FOR GRADUATION*** All thesis students will have their account billed a one-time-only $145 nonrefundable thesis fee by the Graduate College.			
x	-	-	-	**COURSEWORK ONLY FINAL CHECK*** For students in approved graduate programs (coursework only) with *no final oral examination. Available on-line.*	Friday, September 8	Friday, January 26	Friday, June 1
x	x	x	x	**Address any INCOMPLETE "I", NR, or F GRADES** on your transcript early in the semester.			
-	x	x	x	**REQUEST FOR FINAL ORAL EXAMINATION*** • Confirm final oral examination date and time with POS committee members. • Submit electronic final oral request at least three weeks before your proposed oral exam date.	3 weeks before exam date or no later than Wednesday, November 1	Friday, March 23	Friday, June 22
x	x	x	x	**CANCELLATION DATE** • If the Graduate College has *not received* the Final Oral Exam Request or the Coursework Only Final Check by this date, graduation will be automatically cancelled and the student will be removed from the graduation list.	November 1	March 23	June 22
-	x	x	x	**Last date for FINAL ORAL EXAMINATION**	Wednesday, November 22	Friday, April 13	Friday, July 13
-	-	x	x	**OPEN YOUR THESIS/DISSERTATION ACCOUNT** with ProQuest no later than this date and input the title of your thesis/dissertation, which will appear in the Commencement Program. http://www.etdadmin.com/cgi-bin/home	November 22	April 13	July 13
-	x	x	x	**GRADUATE APPROVAL FORM * and REPORT OF FINAL ORAL** • Your Major Professor(s) and DOGE(s) review the content and format of your **final** ETD thesis and ***approve*** it. The Thesis Office needs the Graduate Approval Form to review your thesis. • Deadline for all grades for INCOMPLETES from previous terms to have been submitted to Registrar. • Any conditions placed on your final oral exam must be removed by your major professor and/or committee members by this date.	Tuesday, November 28	Tuesday, April 17	Tuesday, July 17
-	-	x	x	**UPLOAD AND SUMBIT your final thesis/dissertation to ProQuest/UMI** http://www.etdadmin.com/cgi-bin/home. Firm deadline. Thesis needs to be approved by Graduate College before graduation.	Thursday, November 30	Thursday, April 19	Thursday, July 19
x	x	x	x	**COMMENCEMENT CEREMONY**	Saturday, December 16	Thursday, May 3	No Ceremony
x	x	x	x	**Diplomas are available approximately three weeks after graduation.**			

Additional Information and Resources

ME Grad Programs Website

http://www.me.iastate.edu/graduate-program/

- *Graduate College Student Handbook* – http://www.grad-college.iastate.edu/publications/gchandbook/.
- *Graduate Education Handbook:* *http://www.grad-college.iastate.edu/gpss/*
- *University Catalog/ISU Bulletin* –http://catalog.iastate.edu/
- *Distance Education Resources* –http://www.distance.iastate.edu/
- *International Students and Scholars Office:* http://www.isso.iastate.edu/
- *OECT Program*: http://www.grad-college.iastate.edu/speakteach/
- *English Placement Test:* http://apling.public.iastate.edu/engl101.html
- *Center for Excellence in Learning and Teaching:* http://www.celt.iastate.edu
- *Teaching Assistant Handbook:* http://www.celt.iastate.edu/teaching/TAhandbook.html
- *Graduate Student Teaching Certificate:* http://www.celt.iastate.edu/gstc
- *Preparing Future Faculty Program:* http://www.celt.iastate.edu/pff/homepage.html

Appendix A: Graduate Core Courses grouped by Disciplinary Area (MEng in ME, MS, PhD)

*(*indicates available online)*

Computational Sciences	
• ME 556: Machine Vision • ME 557*: Computer Graphics and Geometric Modeling • ME 580*: Virtual Worlds • ME 584: Technology, Globalization, and Culture	• ME 625: Surface Modeling • MATH 525: Numerical Analysis of High Performance Computing • MATH 554: Introduction to Stochastic Processes • EE 547: Pattern Recognition
Fluids	
• ME 530*: Advanced Thermodynamics • ME 532*: Thermodynamics of Compressible Flow • ME 538*: Advanced Fluid Flow • ME 539: Nanoscale Heat Transfer	• ME 546/547: Computational Fluid Dynamics and Heat Transfer I/II • ME 632: Multiphase Flow • ME 637: Convection Heat Transfer • ME 647: Advanced Computational Fluid Dynamics
Energy	
• ME 510*: Economics and Policy of Engineered Energy Systems • ME 530*: Advanced Thermodynamics • ME 531*: Advanced Energy Systems and Analysis • ME 535: Thermochemical Processing of Biomass • ME 536*: Advanced Heat Transfer	• ME 539: Nanoscale Heat Transfer • ME 542: Advanced Combustion • ME 545*: Thermal Systems Design • ME 637: Convection Heat Transfer • ME 648: Radiation Heat Transfer • ABE 504: Instrumentation for Agricultural and Biosystems Engineering
Multi-scale Engineering	
• ME 517*: Advanced Machine Design • ME 520*: Material and Manufacturing Considerations in Design • ME 521*: Mechanical Behavior and Manufacturing of Polyers and Composites • ME 523: Creativity and Imagination in Engineering Design • ME 525*: Mechanical Systems Optimization • ME 527*: Mechanics of Machining and Finishing Processes • ME 528*: Nanomanufacturing and MEMS Technology	• ME 539: Nanoscale Heat Transfer • ME 560*: Surface Engineering • ME 561: Scanning Probe Microscopy • ME 563*: Nanomechanics • ME 564: Fracture and Fatigue • ME 566: Phase Transformation in Elastic Materials • EM 510: Continuum Mechanics • EM 516: Mechanics of Deformable Solids • EM 525*: Finite Element Analysis • MSE 540: Mechanical Behavior of Materials • MSE 552*: Scanning Electron and Auger Microscopy
Systems	
• AERE/IE 565*: Systems Engineering and Analysis • IE 566: Applied Systems Engineering • IE 577*: Human Factors • ME 511*: Advanced Control System Design • ME 518: Advanced Dynamics of Machinery • ME 543*: Random Vibrations • ME 552: Advanced Acoustics	• ME 573*: Random Signals and Kalman Filerting • ME 574*: Optimal Control • ME 575: Introduction to Robust Control • ME 576*: Digital Feedback Control Systems • ME 577*: Linear Systems • ME 578: Nonlinear Systems • MATH 501: Introduction to Real Analsysi

Appendix B: Approved Courses for Math/Stat Requirement (MEng in ME, MS, PhD)

*(*indicates available online)*

<table>
<tr><th colspan="2">Optimization (linear, nonlinear, and integer programming; global optimization methods)</th></tr>
<tr><td>IE 510*: Network Analysis
IE 534*: Linear Programming
IE 631: Nonlinear Programming
IE 632: Integer Programming</td><td>Econ 500/600: Quantitative Methods in Economic Analysis I/II
Econ 509: Applied Numerical Methods in Economics</td></tr>
<tr><th colspan="2">Modeling and Simulation (physical modeling through differential equations and their solution, computer visualization)</th></tr>
<tr><td>EM 425: Introduction to Finite Element Methods
EM 525*: Finite Element Analysis
EM 526: Boundary Element Methods in Engineering
Phys 480/481: Quantum Mechanics I/II
Phys 531: Statistical Mechanics
Phys 564: Advanced Classical Mechanics
Phys 591/592: Quantum Physics I/II
ME 546/547: Computational Fluid Dynamics and Heat Transfer I/II</td><td>ME 557*: Computer Graphics and Geometric Modeling (Note: This course can be counted on a student’s POS if they were admitted prior to Fall 2013.)
ComS 477/577: Problem Solving Techniques for Applied Computer Science
AerE 647: Advanced High Speed Computational Fluid Dynamics
AerE 572: Turbulence
ChE 545: Analytical and Numerical Methods
ME 625: Surface Modeling</td></tr>
<tr><th colspan="2">Mathematical Theory</th></tr>
<tr><td>Linear & abstract algebra, real & functional analysis
AerE 501X: Advanced Engineering Analysis
EM 510: Continuum Mechanics
EE 570: Systems Engineering Analysis and Design
EE 674: Advanced Topics in Systems Engineering
Phys 534: Symmetry and Group Theory in Physics</td><td>Probability and Statistics (outside of statistics department)
IE 513: Analysis of Stochastic Systems
IE 533: Reliability
Econ 500: Quantitative Methods in Economic Analysis I
Econ 509: Applied Numerical Methods in Economics
Econ 571: Intermediate Econometrics
Econ 671/672: Econometrics I/II</td></tr>
</table>

Appendix C: Approved Courses for Math/Stats Requirement (Energy Systems)

<table>
<tr><th colspan="2">All Math and Statistics Courses 400 and higher labeled non-major graduate credit</th></tr>
<tr><td colspan="2">Popular courses include:

• STAT 401*: Statistical Method for Researchers
• STAT 495*: Applied Statistics for Industry</td></tr>
<tr><th colspan="2">Optimization (linear, nonlinear, and integer programming; global optimization methods)</th></tr>
<tr><td>• IE 510*: Network Analysis
• IE 534*: Linear Programming
• IE 631: Nonlinear Programming
• IE 632: Integer Programming</td><td>• Econ 500/600: Quantitative Methods in Economic Analysis I/II
• Econ 509: Applied Numerical Methods in Economics</td></tr>
<tr><th colspan="2">Modeling and Simulation (physical modeling through differential equations and their solution, computer visualization)</th></tr>
<tr><td>• EM 425: Introduction to Finite Element Methods
• EM 525: Finite Element Analysis
• EM 526: Boundary Element Methods in Engineering
• Phys 480/481: Quantum Mechanics I/II
• Phys 531: Statistical Mechanics
• Phys 564: Advanced Classical Mechanics
• Phys 591/592: Quantum Physics I/II
• ME 546*/547: Computational Fluid Dynamics and Heat Transfer I/II</td><td>• ME 557*: Computer Graphics and Geometric Modeling (Note: This course can be counted on a student’s POS if they were admitted prior to Fall 2013.)
• ComS 477/577: Problem Solving Techniques for Applied Computer Science
• AerE 647: Advanced High Speed Computational Fluid Dynamics
• AerE 572: Turbulence
• ChE 545*: Analytical and Numerical Methods</td></tr>
<tr><th colspan="2">Mathematical Theory</th></tr>
<tr><td>Linear & abstract algebra, real & functional analysis

• EM 510: Continuum Mechanics
• EE 570*: Systems Engineering Analysis and Design
• EE 674: Advanced Topics in Systems Engineering
• Phys 534: Symmetry and Group Theory in Physics</td><td>Probability and Statistics (outside of statistics department)

• IE 513*: Analysis of Stochastic Systems
• IE 533*: Reliability
• Econ 500: Quantitative Methods in Economic Analysis I
• Econ 509: Applied Numerical Methods in Economics
• Econ 571: Intermediate Econometrics
• Econ 671/672: Econometrics I/II</td></tr>
</table>

Appendix D: Approved Professional Development Courses for M.Eng

Masters of Engineering in Mechanical Engineering (*indicates available online)

• ConE 380*: Engineering Law • Econ 355: International Trade and Finance • HCI 655: Organizational and Social Implications of Human Computer Interaction • HG ED 561*: College Teaching • IE 570*: Systems Engineering and Project Management • ME 584*: Technology, Globalization and Culture	• MGMT 472: Management of Diversity • SCM 501*: Supply Chain Management • Any foreign language courses (prerequisites may be needed which will not count towards the requirements) • Other courses, as approved by the POS committee

Masters of Engineering in Energy Systems (*indicates available online)

• ConE 380*: Engineering Law • Econ 355: International Trade and Finance • Fin 501*: Financial Valuation and Corporate Financial Decisions • HCI 594X*: Organizational Application of Collaborative Technology • HG ED 561: College Teaching • IE 563*: Engineering Management Theory • IE 570*: Systems Engineering and Project Management • ME 584*: Technology, Globalization and Culture • MGMT 503*: Professional Responsibility in Business and Society • MGMT 570: Managing Employee Attitudes and Behaviors	• MGMT 571: Seminar in Personnel and Human Resources Management • MGMT 583*: Strategic Management of Innovation • MKT 501*: Marketing • SCM 502: Supply Chain Management • SCM 524*: Strategic Process Analysis and Improvement • Any foreign language courses labeled "non-major graduate credit" (prerequisites may be needed which will not count toward this requirement • Other courses, as approved by the POS committee

Appendix E: Elective Engineering Courses (Energy Systems)

Fifteen (15) graduate credits in energy systems engineering from an approved list. These courses are determined by the student and academic advisor to fit the needs of the individual student's program. If the student's undergraduate degree did not include a course in thermodynamics, three (3) credits must be ChE 357, MatE 311, or ME 332 or the equivalent.

Students must take at least nine (9) credits in a single focus area: biorenewables (B), wind (W), nuclear (N), power generation and distribution (P), building energy and energy efficiency (E), or thermal science (T).

Approved courses for Engineering Electives requirement (Many of these courses are offered online):

Per the graduate school requirements, up to three (3) courses at the 400 level will be permitted, or a POS may include one (1) 300-level class and two (2) 400-level classes; all other classes must be at the graduate level (500 and above).

		Focus Area					
Course	Course Title	B	W	N	P	E	T
ABE 363	Agri-Industrial Applications of Electric Power and Electronics				X		
ABE 413	Fluid Power Engineering				X		X
ABE 572	Design of Environmental Modification Systems for Animal Housing					X	
ABE 580	Engineering Analysis of Biological Systems	X					
AerE 381	Introduction to Wind Energy		X				
AerE 481	Advanced Wind Energy: Technology and Design		X				
AerE 546	Computational Fluid Dynamics and Heat Transfer I		X			X	X
AerE 547	Computational Fluid Dynamics and Heat Transfer II		X			X	X
AerE 570	Wind Engineering		X				
BRT 501	Fundamentals of Biorenewable Resources	X					
BRT 515	Biorenewables Law and Policy	X					
BRT 516	International Biorenewables Law and Policy	X					
BRT 535	Thermochemical Processing of Biomass	X					
ChE 357	Transport Phenomenon II						X
ChE 358	Separations	X					X
ChE 381	Chemical Engineering Thermodynamics						X
ChE 382	Chemical Reaction Engineering						X
ChE 515	Biochemical Engineering	X					
ChE 554	Integrated Transport Phenomenon	X					X
ChE 587	Advanced Chemical Reactor Design						X
ChE 583	Advanced Thermodynamics	X			X	X	X
ChE 632	Multiphase Flow						X
ChE 652	Advanced Transport						X
CE 540	Bioprocessing and Bioproducts	X					
CE 594S	Building Energy Modeling					X	
ConE 353	Electrical Systems in Buildings					X	
ConE 354	Building Energy Systems					X	
EE 448	Introduction to AC Circuits and Motors				X		
EE 455	Introduction to Energy Distribution Systems				X		
EE 456	Power System Analysis I				X		
EE 457	Power System Analysis II				X		
EE 458	Economic Systems for Electric Power Planning				X		
EE 552	Energy System Planning				X		
EE 553	Steady State Analysis				X		
EE 554	Power System Dynamics				X		
EE 555	Advanced Energy Distribution Systems				X		
EE 556	Power Electronic Systems				X		
EE 559	Electromechanical Wind Energy Conversion and Grid Integration		X		X		
EE 653	Advanced Topics in Electric Power Systems Engineering				X		
IE 543	Wind Energy Manufacturing		X				

		Focus Area					
Course	Course Title	B	W	N	P	E	T
ME 332	Engineering Thermodynamics II				X	X	X
ME 413	Fluid Power Engineering				X		X
ME 433	Alternative Energy Conversion	X	X	X	X	X	X
ME 436	Heat Transfer					X	X
ME 437	Introduction to Combustion Engineering				X		X
ME 441	Fundamentals of Heating, Ventilating and Air Conditioning					X	
ME 442	Heating and Air Conditioning Design					X	
ME 444	Elements and Performance of Power Plants			X	X		X
ME 448	Fluid Dynamics of Turbomachenery				X		X
ME 449	Internal Combustion Engine Design				X		X
ME 530	Advanced Thermodynamics				X	X	X
ME 532	Compressible Fluid Flow				X		X
ME 535	Thermochemical Processing of Biomass	X					
ME 536	Advanced Heat Transfer					X	X
ME 538	Advanced Fluid Flow						X
ME 539	Nanoscale Heat Transfer					X	X
ME 542	Advanced Combustion				X		X
ME 545	Thermal Systems Design	X	X	X	X	X	X
ME 546	Computational Fluid Mechanics and Heat Transfer I		X			X	X
ME 547	Computational Fluid Mechanics and Heat Transfer II		X			X	X
ME 632	Multiphase Flow						X
ME 637	Convection Heat Transfer					X	X
ME 638	Radiation Heat Transfer			X		X	X
MatE 311	Thermodynamics in Materials Engineering						X
MSE 520	Thermodynamics and Kinetics of Multicomponent Materials						X
NucE 401	Nuclear Radiation Theory and Engineering			X			
NucE 421	Nuclear Criticality Safety			X			
NucE 441	Probabilistic Risk Analysis			X			
NucE 461	Radiation Detection, Measurement and Simulation			X			

Appendix F: Mechanical Engineering Faculty and Staff Directory

Department of Mechanical Engineering

Last Name	First Name	Office	Room No.	e-mail	Title
Agba	Emmanuel	4-3005	1245 Hoover	eagba	Senior Lecturer
Attinger	Daniel	4-1692	2036 Black	attinger	Associate Professor
Bai	Xianglan	4-6886	2070 Black	bxl9801	Assistant Professor
Balasubramanian	Ganesh	4-9226	2092 Black	bganesh	Assistant Professor
Bartleson	Cindy	4-0356	2025 Black	cmbartl	Administrative Specialist; Assistant to Chair
Baughman	Jacqulyn	4-5523	1343 Hoover	jacqulyn	Senior Lecturer
Bentil	Sarah	4-8528	2104 Black	sbentil	Assistant Professor
Bhattacharya	Sourabh	4-0569	2102 Black	sbhattac	Assistant Professor, Henry Black Faculty Fellow in Mechanical Engineering
Bigelow	Timothy	4-4177	2113 Coover - 3060	bigelow	Associate Professor, Mechanical Engineering and Electrical and Computer Engineering
Bremer	Sandy	4-2656	1260A Hoover	sbremer	Teaching Lab Coordinator
Brown	Robert	4-7934	1140E Brl - 3270	rcbrown	Gary and Donna Hoover Chair in Mechanical Engineering; Anson Marston Distinguished Professor of Engineering; Iowa Farm Bureau Director, Bioeconomy Institute; Director, Center for Sustainable Environmental Technologies
Bryden	Kenneth "Mark"	4-3891	1620 Howe - 2274	kmbryden	Associate Professor; Program Director, Simulation, Modeling and Decision Science - Ames Laboratory
Buehler	Joel	4-7269	2071 Black	jbuehler	Systems Support Specialist
Chandra	Abhijit	4-4834	2106 Black	achandra	Professor
Claussen	Jonathan	4-4690	2104 Black	jcclauss	Assistant Professor
Clemens	Kristin	4-0838	2019 Black	clemens	Program Assistant, Undergraduate Education
Dautremont	Jim	4-6590	2079 Black	dautremo	Laboratory Mechanical Technologist
Delarm	Josh	4-8368	1260C Hoover	jdelarm	Teaching Laboratory Coordinator
Deza	Mirka	4-0841	205 Lab of Mech	mdeza	Lecturer
Dickson	Derek	4-8686	0150 BRL	djd25	Systems Support Specialist I
Dikeman	Matt	4-5976	2620 Howe	mdikeman	Academic Adviser

Fetty	Nick	4-5065	2025 Black	nrfetty	Communication Specialist
Feve	Sebastien	4-0069	1237 Hoover	sfeve	Lecturer
Ganapathysubramanian	Baskar	4-7442	306 Lab of Mech	baskarg	Associate Professor
Golay	Hallie	4-0838	2019 Black	schonh1	Graduate Program Assistant
Gross	Rachael	4-1423	2025A Black	rlgross	Fiscal Officer
Hagge	Mathew	4-4270	2098 Black	fforty	Senior Lecturer

Hashemi	Nastaran	4-2877	2028 Black	nastaran	Assistant Professor; William March Scholar in Mechanical Engineering
Hayes	Caroline	4-7121	2025B Black	cchayes	Chair, Lynn Gleason Professor of Interdisciplinary Engineering
Heindel	Ted	4-0057	2018 Black	theindel	Bergles Professor of Thermal Science
Heise	Jim	4-3857	1243 Hoover	jheise	Senior Lecturer, Design Projects Coordinator
Howell	John	4-5534	1043 Black	jlhowell	Teaching Lab Coordinator
Hsu	Ming-Chen	4-4632	304 Lab of Mech	jmchsu	Assistant Professor
Hu	Chao	4-0771	2026 Black	chaohu	Assistant Professor
Hu	Shan	4-2532	2076 Black	shanhu	Assistant Professor
Jensen	Nate	4-9415	2072 Black	njensen	Systems Support Specialist 291-9415 - 2nd cell #
Juarez	Jaime	4-3298	2020 Black	jjuarez	Assistant Professor
Kelkar	Atul	4-0788	2038 Black	akelkar	Professor
Kim	Gap-Yong	4-6938	2034 Black	gykim	Associate Professor
Kolstad	Owen	4-8982	2074 Black	okolstad	Lecturer
Kong	Song-Charng	4-3244	2014 Black	kong	Associate Professor Associate Chair for Graduate Studies and Research
Krishnamurthy	Adarsh	4-5568	303 Lab of Mech	adarsh	Assistant Professor
Lehman	Neely	4-1423	2025 Black	nbushore	Administrative Specialist

Levitas	Valery	4-9691	2351 Howe	vlevitas	Schafer 2050 Challenge Professor; Professor, Mechanical Engineering and Aersospace Engineering; Professor, Materials Science and Engineering (4/5 AErE, 1/5 ME)'4-0771
Lloyd	Fred	4-1744	2620G Howe	fslloyd	Academic Adviser
Lograsso	Barbara	4-0349	2064 Black	bklogras	Lecturer
Lott	Katie	4-1423	2025 Black	klott	Administrative Specialist
Lu	Meng	4-9951	305 Durham	menglu	Assistant Professor (2/3 ECpE, 1/3 ME)
Luecke	Greg	4-5916	2016 Black	grluecke	Associate Professor
MacKenzie	Aliza	4-6366	2620 Howe	aliza	Academic Adviser
Martinek	Wyman	4-3362	1086 Black	wyman	Teaching Laboratory Coordinator
Mathison	Margaret	4-4850	1345 Hoover	mm1	Lecturer
Maxwell	Gregory	4-8645	2012 Black	gmaxwell	Associate Professor; Director, Industrial Assessment Center
Merkle	Scott	4-5575	1337 Hoover	samerkle	Senior Lecturer
Messman	Michael	4-0674	2100 Black	mmessman	Senior Lecturer
Michael	James	4-0723	2096 Black	jmichael	Assistant Professor
Mittleider	Alyssa	4-2012	2043E Black	amittlei	Academic Advisor
Montazami	Reza	4-8733	2094 Black	reza	Assistant Professor

Oliver	James	4-2649	1620 Howe - 2274	oliver	Larry and Pam Pithan Professor of Mechanical Engineering; Director, Virtual Reality Applications Center
Olsen	Michael	4-0073	2008 Black	mgolsen	Professor
Padalkar	Sonal	4-6066	2068 Black 2022 Black	padalkar	Assistant Professor
Passalacqua	Alberto	4-5047	302 Lab of Mech	albertop	Assistant Professor
Peterson	Hazel	4-4932	2043 Black	hpeters	Sec II
Pittoni	Paola	4-6940	204 Lab of Mech	ppittoni	Lecturer
Radkowski	Rafael	4-7044	1620E Howe	rafael	Assistant Professor
Ren	Juan	4-1805	2030 Black	juanren	Assistant Professor
Sarkar	Soumik	4-5212	2100 Black	soumiks	Assistant Professor
Schroeder	Deb	4-0859	2025 Black	daschroe	Clerk
Schwartz	Cris	4-2866	2024 Black	cris1	Associate Professor
Schweizer	Taylor	4-4306	1056 Black	tjames	Teaching Laboratory Coordinator
Severson	Craig	4-1715	1260C Hoover	craigsev	Teaching Lab Coordinator
Shapiro	Howard		2066 Black	hshapiro	Lecturer
Shelledy	Jim	4-7283	1043 Black	shelledy	Teaching Lab Coordinator

Shrotriya	Pranav	4-9719	2022 Black	shrotriy	Associate Professor
Sippel	Travis	4-3803	2090 Black	tsippel	Assistant Professor
Starns	Gloria	4-9946	2032 Black	gkstarns	Senior Lecturer; Teaching Schedule Coordinator
Subramaniam	Shankar	4-3698	305 Lab of Mech	shankar	Professor
Sundararajan	Sriram	4-1050	2080 Black 2022 Black	srirams	Professor; Associate Chair for Undergraduate Studies
Thrasher	Patti	4-7455	2025 Black	pdt	Grant Coordinator
Van Winkle	Jessica	4-9354	2043B Black	jessica	Academic Adviser
Vance	Judy	4-9474	1620 Howe -2274	jmvance	Joseph C. and Elizabeth A. Anderlik Professor of Engineering
Vosseller	Jessica	4-2101	2086 Black	jessiev	Academic Adviser
Wagner	John	4-3686	2043D Black	jdwagner	Academic Adviser; Coordinator, Kiewit Mechanical Engineering Student Services Center
Wang	Xinwei	4-2085	2010 Black	xwang3	Professor
"	"	4-8023	0271 ASC II		Lab 180J ASC I/Students 222 & 258 ASC I
Wickert	Jonathan	4-0070	1550 Beardshear	wickert	James and Katherine Melsa Professor in Engineering
Winer	Eliot		1620 Howe - 2274	ewiner	Associate Professor
Wolfe	Johna	4-6187	2043A Black	jswolfe	Academic Adviser
Wright	Mark	4-0913	2078 Black	markmw	Assistant Professor

Appendix G: Mechanical Engineering Faculty Research Areas

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Mechanical Engineering

Bioengineering and Translational Health	Computational Sciences and Visualization	Multiphase Flow and Complex Fluids	Design & Manufacturing & Nanoscale Scienc	Dynamic Systems, Sensors, and Controls	Energy Sciences and Sustainability	Faculty Areas of Expertise
		*				Daniel Attinger
					*	Xianglan Bai
		*	*		*	Ganesh Balasubramanian
		*				Sarah Bentil
	*			*		Sourabh Bhattacharya
*			*			Timothy Bigelow
					*	Robert Brown
	*				*	Mark Bryden
	*		*		*	Abhijit Chandra
		*				Jonathan Claussen
	*	*			*	Baskar Ganapathysubramanian
*		*	*			Nastaran Hashemi
			*			Caroline Hayes
		*			*	Ted Heindel
*	*		*			Ming-Chen Hsu
	*		*			Chao Hu
			*	*	*	Shan Hu
	*			*	*	Atul Kelkar
*		*	*			Jaime Juarez
			*			Gap-Yong Kim
	*	*			*	Song-Charng Kong
*	*	*	*			Adarsh Krishnamurthy

Bioengineering and Translational Health	Computational Sciences and Visualization	Multiphase Flow and Complex Fluids	Design & Manufacturing & Nanoscale Scienc	Dynamic Systems, Sensors, and Controls	Energy Sciences and Sustainability	Faculty Areas of Expertise
	*		*			Valery Levitas
*			*			Meng Lu
				*		Greg Luecke
	*		*		*	Gregory Maxwell
		*			*	Mark Wright
		*			*	James Michael
	*		*		*	Reza Montazami
	*		*			Jim Oliver
		*				Mike Olsen
			*		*	Sonal Padalkar
		*				Alberto Passalacqua
	*		*			Rafael Radkowski
*			*	*		Juan Ren
	*	*		*		Soumik Sarkar
*	*		*			Cris Schwartz
*			*			Pranav Shrotriya
		*	*		*	Travis Sippel
		*				Shankar Subramniam
			*			Sriram Sundararajan
	*		*			Judy Vance
	*		*		*	Xinwei Wang
*	*		*			Eliot Winer

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