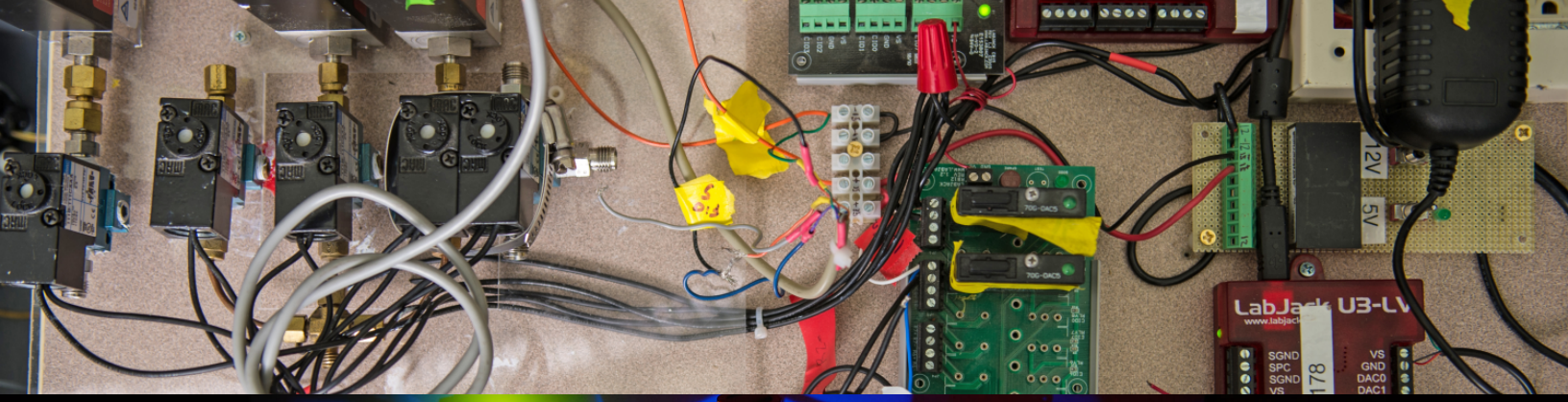
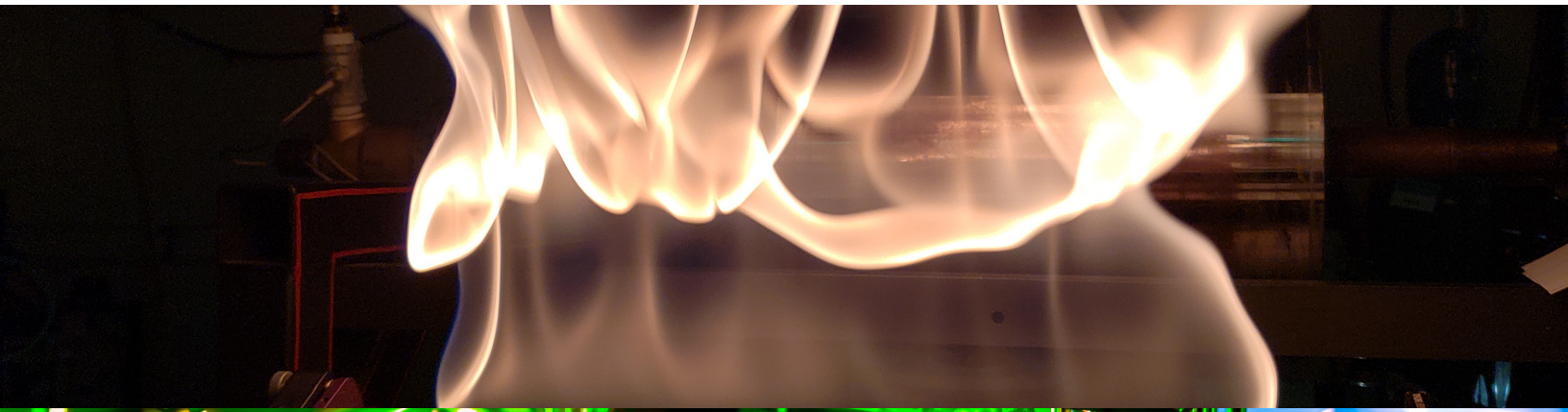


Paul M. Rady Department of Mechanical Engineering
Graduate Program Handbook

University of Colorado, Boulder

2025-2026 Academic Year



PAUL M. RADY DEPARTMENT OF MECHANICAL ENGINEERING
GRADUATE PROGRAM HANDBOOK

UNIVERSITY OF COLORADO, BOULDER

2025-2026 ACADEMIC YEAR

LAST UPDATED: OCTOBER 7, 2025

Contents

1 Graduate Program Overview

1.1 Department Vision

The Department of Mechanical Engineering at the University of Colorado, Boulder (CU) will develop new scientific understanding, launch innovative technologies, and nurture creative engineers who will solve pressing societal challenges to improve health, enhance security, and create a clean and sustainable energy future. Faculty, students, and staff in the department seek to:

- **Be known for high-impact research:** Our faculty are internationally known for strengths in biomedical engineering, renewable and sustainable energy, and materials innovation. We plan to build that same prominence in soft robotics, imaging complex media, and quantum technologies. Our faculty and students will continue to publish in high-impact journals, spin off technology companies, become future faculty, and serve on national advisory boards.
- **Be a national leader in project-based education:** Project-based learning improves training for the practice of engineering, and project-based education provides the best opportunity to connect research and educational activities. Specifically, we will establish our leadership through faculty and student fellowships and awards.
- **Be a national leader in inclusive excellence:** Research shows that diversity in engineering teams and in companies leads to more innovative and successful outcomes. We feel strongly that we all deserve the opportunity to be global leaders in engineering.
- **Support engaged scholarship, an innovative spirit, and a collaborative community including alumni:** Our faculty are recognized nationally and internationally, and our students go on to successful careers in industry, academic, and the public sector. We seek to broaden the impact of our program through outreach and to also maintain close connections with our alumni so that we can be as responsive as possible to current trends in hiring, research, and instruction.

1.2 Graduate Program Mission Statement

The CU mechanical engineering graduate program supports the department vision by establishing an environment of respect and inclusive excellence where high-quality instruction, project-based learning, and cutting-edge research are leveraged to educate and nurture the next generation of socially conscious, deeply knowledgeable engineers, scientists, and problem-solvers. We are uncompromising in our belief that respect, inclusiveness, accountability, community engagement, honesty, and a commitment to excellence are the core values of any successful graduate program. These are the values that we work to continuously promote in students,

faculty, and staff, so that our graduates become our greatest ambassadors.

1.3 Degree Programs

With over 70 research and instructional faculty members, our graduate students have access to dynamic and interdisciplinary research and courses within our PhD, master's degree, and certificate programs.

- **PhD Program:** Mechanical engineering PhD students at CU take part in cutting-edge, tier-one research, learning from nationally and internationally recognized faculty. Our research harnesses state-of-the-art experimental, theoretical, and computational approaches to expand the frontiers of technology, while advancing fundamentals in a wide range of disciplines.
- **Master's Degree Programs:** Mechanical engineering master's degree students can take graduate courses and participate in research as part of four different programs.
  - *Master of Science (MS) Professional Program:* The MS Professional Program is our most popular master's degree option, offering exciting opportunities for a wide range of prospective students from diverse backgrounds. It emphasizes project-based and curriculum-driven learning and is targeted at working engineers and undergraduates considering a career in industry.
  - *Master of Science (MS) Thesis Program:* The MS Thesis Program is intended for MS students interested in a short-term research experience, leading to the preparation and defense of a research-based thesis. The program emphasizes education through high-quality research for students interested in careers in industry and the public sector.
  - *Bachelor's Accelerated Master's (BAM) Program:* The BAM degree program offers currently enrolled CU undergraduate students in mechanical engineering, environmental engineering, and integrated design engineering with an emphasis in ME the opportunity to receive bachelor's and master's degrees in a shorter period of time.
  - *Dual Degree Mechanical Engineering and Engineering Management Program:* Students in the MS Professional Program may apply for a dual degree in Engineering Management. This program is intended for students seeking a strong education in both technical and fundamental topics, as well as the unique skills required to be a successful leader in industry and the public sector.
- **Certificate Programs:** Either degree-seeking or non-degree students can enroll in course certificate programs offered by our department. These certificates indicate expertise in a focused topic area.

1.4 Contact Information and Personnel

The Department of Mechanical Engineering is located in the Engineering Center at CU, with the following physical and mailing addresses:

Physical address (map):	**Mailing address:**
1111 Engineering Drive	427 UCB
Boulder, CO 80309	Boulder, CO 80309-0427

Overall administration of the graduate program, review of applications, and admissions decisions are handled by the graduate committee. This committee consists of approximately 12 current members of our faculty, as well as our Lead TA (a PhD student), a representative from the Committee for Equity in Mechanical Engineering (CEME), and a master's degree student representative. Faculty on the graduate committee change from year to year and represent a range of different research and educational areas in our department.

During the 2025-2026 academic year, Prof. Daven Henze will serve as Graduate Program Chair. Vera Dorosh is the Senior Graduate Program Manager responsible for graduate program administration, PhD recruitment/admission, certificate programs, and co-teaching MCEN 5000 Sociotechnical Industry Skills; Anna Guy is the Senior Graduate Specialist responsible for PhD academic advising and administration; Megan Varra is the Graduate Program Specialist who oversees MS recruitment, admission, and advising; and Mary Young provides graduate program support. Kayla Rasavanh is the 2025-2026 Lead TA and Maria Vabson is the Lead TA Elect.

2025-26 Graduate Leadership, Advising, and Administration:

- **Dr. Daven Henze**, Professor, Graduate Program Chair
  daven.henze@colorado.edu, ECME 265
- **Vera Dorosh**, Senior Graduate Program Manager
  vera.dorosh@colorado.edu, ECME 107
- **Anna Guy**, Senior Graduate Specialist, PhD Students
  anna.guy@colorado.edu, ECME 105A
- **Megan Varra**, Graduate Program Specialist, MS Current and Prospective Students
  megan.varra@colorado.edu, ECME 105
- **Mary Young**, Graduate Program Coordinator (part-time)
  megrad@colorado.edu
- **Kayla Rasavanh**, Lead TA 2025-2026
  Kayla.Rasavanh@colorado.edu

If you have a question and are not sure who to contact, you can also email megrad@colorado.edu.

1.5 Student Expectations and Policies

A complete list of CU student, faculty, and staff policies, to which the mechanical engineering graduate program adheres, can be found at the Compliance, Ethics, and Policy Matters website. In addition, please view Graduate School policies. Select expectations and policies of greatest relevance to mechanical engineering graduate students are provided in the following sections.

1.5.1 Honor Code Policy

All students of CU are responsible for knowing and adhering to the academic integrity policy. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic and non-academic sanctions (including but not limited to university probation, suspension, or expulsion).

The University Honor Code and Procedures are accessible via the Student Conduct and Conflict Resolution website. All Department of Mechanical Engineering graduate students are expected to adhere to this code.

1.5.2 Classroom Behavior Policy

Students and faculty each have a responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran status, sexual orientation, gender, gender identity and gender expression, age, disability, and nationalities. Class rosters are provided to instructors with the student's legal name, but instructors will honor student requests to address them by an alternate name or gender pronoun. Students should advise instructors of this preference early in the semester so that they may make appropriate changes to their records. View additional classroom behavior policy details.

1.5.3 Discrimination and Harassment Policy

CU is committed to providing an inclusive environment where all individuals can achieve their academic and professional aspirations free from discrimination, harassment, and/or related retaliation based upon protected classes.

CU prohibits discrimination and harassment on the basis of protected-class status in admission and access to, and treatment and employment in, its educational programs and activities. For purposes of this CU policy, "protected classes" refers to race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation, and political philosophy.

CU takes prompt and effective steps reasonably intended to stop any form of protected-class discrimination and harassment, and related violations, to eliminate any hostile environment, to prevent its recurrence, and as appropriate, to remedy its effects.

At CU, the Office of Institutional Equity and Compliance (OIEC) implements this policy and administers related campus procedures. Anyone who encounters an issue or seeks guidance related to this policy should consult with the OIEC. CU Boulder employees who are mandatory reporters (i.e., "Responsible Employees"), including faculty and graduate advisors, must promptly report allegations of protected-class discrimination and harassment, and related violations, as further outlined in the policy.

View the full university Discrimination and Harassment policy.

Additionally, instructors are required to observe religious holidays for absences from class and exams, according to campus policy.

1.6 Mental Health and Other Campus Resources

Students with a variety of concerns, such as academics, anxiety, body image, depression, relationships, substance use and more, should contact Counseling & Psychiatric Services (CAPS), which is a confidential, on campus mental health and psychiatric service.

Counseling & Psychiatric Services (CAPS)
Phone: 303-492-2277 (24/7 phone)
Location: Center for Community, N352
Office Hours

The Office of Victim Assistance (OVA) also provides free and confidential information, consultation, support, advocacy, and short-term counseling services to CU students, graduate students, faculty and staff who have experienced a traumatic, disturbing or life disruptive event.

Office of Victim Assistance (OVA)
Email: assist@colorado.edu
Phone: 303-492-8855 (24/7 phone); after hours press 2 to talk to a counselor
Location: Center for Community, N450
Office Hours

View additional campus resources and more general health resources.

1.7 Grievance Procedures

The Graduate School established revised grievance procedures, effective April 1, 2019, that can be found here: Graduate School Grievance Procedures. These procedures are intended to provide a process by which graduate students can communicate concerns related to academic issues or academic conflicts. View this additional brief guide. Should a student need any assistance with these procedures, they should reach out to their Graduate and/or Faculty advisor, where appropriate.

1.8 Departmental Staff Contacts

A list of the financial, advising, communications, human resources (HR), and facilities staff members available to help faculty and students in our department can be found in the Staff Directory. Students can also email megrad@colorado.edu with questions.

1.9 Academic Calendar and Registration Deadlines

View the academic calendar, as well as additional information on course add/drop, tuition/fees, and registration deadlines at the Office of the Registrar website. While the Graduate Program will provide information and reminders about important dates throughout the academic year, students are expected to be aware of any add/drop deadlines and tuition/fees impacts of their enrollment decisions. If you are unsure of the consequences of adding/dropping a course (especially outside of your university designated enrollment window),

please reach out to your academic advisor.

1.10 Helpful Links

Additional resources and information of relevance to prospective and current mechanical engineering graduate students can be found at:

- **University Home Page**
- **Graduate School**
- **College of Engineering**
- **Department of Mechanical Engineering**
- **ME Department Calendar**
- **Buff OneCard**
- **Bursar's Office**
- **Campus Policies**
- **Graduate School Catalog**
- **Medical Services**
- **Office of Information Technology**
- **Office of Institutional Equity and Compliance**
- **Office of the Registrar**
- **Parking and Transportation**
- **Recreation Services**
- **Athletics**
- **Local News**
- **Elevations Credit Union**
- **Regional Transportation District (RTD)**

2 Internal Admission

2.1 Overview

In the Department of Mechanical Engineering, we have a diverse group of graduate students who benefit from—and directly support—an inclusive and supportive educational environment that emphasizes shared excellence. The admissions process plays a critical role in maintaining these values, and we seek to continue growing our graduate program by emphasizing diversity, participation by under-represented groups, community engagement, and technical excellence.

Graduate admissions decisions are made by a committee comprised of the graduate program chair, the graduate advisors, and faculty from the department. When making admissions decisions, this committee conducts a holistic review of all application materials. For more information on eligibility and application requirements, please visit our departments graduate admission webpages. Below you will find information for current students who wish to apply to the Bachelor Accelerated Master (BAM) program or who are MS students wishing to apply to the PhD program.

2.2 Eligibility

2.2.1 Bachelor's Accelerated Master's (BAM) Degree Program

Current CU mechanical engineering undergraduate students who meet the following criteria are eligible for admission to the BAM degree program in mechanical engineering:

- Must have a cumulative GPA of 3.25 or higher;
- Must have no Minimum Academic Preparation Standards (MAPS) deficiencies (Students who matriculated Summer 2023 and after will not need to meet MAPS as a part of BAM admission requirements);
- Must have at least junior class standing (60 credits completed);
- Must have completed four of the following six courses:
  - MCEN 3012: Thermodynamics
  - MCEN 3021: Fluid Mechanics
  - MCEN 3022: Heat Transfer
  - MCEN 3025: Component Design
  - MCEN 3030: Computational Methods
  - MCEN 3032: Thermodynamics 2

Course substitutions listed on the MD Undergradute Program curriculum website and cross listed courses in the CU Boulder catalog will be approved for substitution of the above courses for admission purposes. If you

are pursuing substitution for courses, please reach out to megrad@colorado.edu before applying.

Students who plan to complete a double major(s) and/or minor(s) are also eligible for admission to the BAM program. In such cases, in addition to the BAM Intent Form, students must submit the BAM Double Major/Minor Certification form, which can be obtained by emailing the graduate advisors at megrad@colorado.edu.

Undergraduate students in the partnership program between CU and Colorado Mesa University (CMU) can be admitted to the BAM degree program if they satisfy the requirements above (or equivalent), if their CU GPA is above 3.0, and if their combined CMU and CU GPA is above 3.25.

2.2.2 Environmental Engineering and Integrated Design Engineering with an emphasis in ME BAM Degree Programs

2.2.3 Dual Degree Mechanical Engineering and Engineering Management Program

Students in the mechanical engineering Professional MS program are eligible to pursue a dual master's degree in Engineering Management. Engineering management requires an undergraduate degree in engineering and a 3.0 or higher GPA from a regionally accredited institution. For full eligibility requirements, please visit the Engineering Management prospective student page. Graduate students in Engineering Management are also eligible for admission to the ME master's degree program, provided that they are admitted to the Mechanical Engineering MS program.

2.3 Application Requirements

2.3.1 Bachelor's Accelerated Master's (BAM) Degree Programs

Eligible students based on the criteria outlined in Sections 2.2.1 and 2.2.2, including students in the CU/CMU partnership program, may apply to either the traditional BAM program or the joint mechanical and environmental BAM program by completing the BAM Intent Form. If a student plans to complete a double major, they should also submit the BAM Double Major/Minor Certification form, which can be obtained by emailing the graduate advisors at megrad@colorado.edu. All applications for admission to the BAM program will be promptly reviewed by the mechanical engineering graduate program staff in accordance with the requirements outlined in Sections 2.2.1 and 2.2.2.

2.3.2 Dual Degree Mechanical Engineering and Engineering Management Program

Students in the MS Program are eligible to apply for the dual degree in mechanical engineering and engineering management. Admission to the engineering management degree is determined by the Engineering Management department. Please visit the Engineering Management Program admissions website to learn more.

Current Engineering Management MS students interested in applying for an MS degree in mechanical engineering should consult the internal application procedures outlined in Section 2.5.

2.4 Deadlines

2.4.1 Bachelor's Accelerated Master's (BAM) Degree Programs

Eligible students interested in applying to any of the BAM programs associated with mechanical engineering can do so throughout the calendar year via the BAM Intent Form. Submission of applications is recommended during either the fall or spring semesters of a student's junior year. Specific deadlines for submission of an application to the BAM program are as follows:

- September 20, 2025 for students graduating with their BS in fall 2025;
- January 20, 2026 for students graduating with their BS in spring 2026;
- February 20, 2026 for students graduating with their BS in summer 2026.

Applicants considering applying later in their undergraduate career should familiarize themselves with all deadlines and requirements for progressing from undergraduate to graduate status on the BAM website.

2.4.2 Dual Degree Mechanical Engineering and Engineering Management Program

Students currently in the Department of Mechanical Engineering who wish to pursue the dual degree with En-

gineering Management should reach out to Ms. Kendra Thibeault at kendra.thibeault@colorado.edu for guidance on any deadlines for application.

Students in the Engineering Management Department wishing to pursue the dual degree with mechanical engineering can reach out to the graduate advisors at megrad@colorado.edu with questions. Please also see Section 2.5 for further information on internal applications.

2.5 Internal Applicants and Changes of Program

Current CU students, both inside and outside the department, can apply to either our master's or PhD degree programs by completing the Internal Graduate Program Application Form. After completing this form and satisfying the other requirements noted below, applications are reviewed in full by the graduate admissions committee.

2.5.1 Applicants within the Department of Mechanical Engineering

Before initiating any program change process, we recommend that students and any faculty member they may be working with reach out to the graduate program directly at megrad@colorado.edu for guidance on these procedures. Requirements for each category of in-department program change are as follows:

- **From BS/BA to Professional MS, MS Thesis, or PhD:** All current CU undergraduate students, including those in mechanical engineering, wishing to apply for the Professional MS, MS thesis, or PhD are required to apply via the Graduate School application process. Please see the mechanical engineering graduate admission pages for more information. Eligible BS students wishing to pursue the Bachelor Accelerated Master (BAM) program may apply internally via the process outlined in Sections 2.3.
- **From BAM to PhD:** Current BAM students interested in the PhD must apply via the Graduate School application process. Please see the mechanical engineering graduate admission pages for more information.
- **From Professional MS (including BAM) to MS Thesis:** Please follow the MS Thesis Milestones outlined in Section 5.4.2.
- **From MS Thesis to MS Professional:** Please email your graduate program advisor (GPA).
- **From PhD to MS Professional or MS Thesis:** Same as above.
- **From Professional MS or MS Thesis to PhD:** There are two paths by which current mechanical engineering graduate students may apply for transfer into the PhD program, depending on their interest in receiving departmental support as a TA/RA:
  - **With departmental funding:** Students seeking departmental funding must submit the Internal Graduate Program Application Form by December 15. Applications in this category are accepted only for a fall semester transfer. Students will be considered, in conjunction with all external candidates applying to the PhD program, for a full academic year TA appointment.
  - **Without departmental funding:** For current graduate students not seeking departmental funding because they have a fellowship (e.g., NSF or NDSEG), have secured funding from a research advisor as an RA, or are self-supported, the Internal Graduate Program Application Form must be completed. For these students, the transfer into the PhD program can be requested for any semester. Submit the form by December 1 to request a spring semester start, April 1 to request a summer semester start and August 1 to request a fall semester start.

For all students transferring into the PhD program, the following items are required in order to submit the Internal Graduate Program Application Form:

- The name and contact information of a current member of the CU faculty (ideally in mechanical engineering) who can comment on the appropriateness of the change into the PhD program. In the case of students transferring into the PhD program without departmental funding, this letter should come from a research advisor who commits to supporting the student for the duration of the PhD.
- A two-page statement from the student outlining research interests, prior research and professional ex-

periences, and reasons for pursuing a PhD degree.
- Unofficial transcripts from CU and all prior undergraduate and/or graduate institutions.
- A current copy of the student's CV. Helpful guidelines on the creation of academic CVs have been compiled by Cornell University and the University of Illinois Urbana-Champaign.

Note that BAM students are only eligible to apply to the PhD program if they have already completed their undergraduate degree(s); additional requirements may be applicable as well.

Additionally, BAM students are prevented by university policy from counting any credits towards the PhD degree that were already applied towards both the undergraduate and master's degrees; therefore, additional coursework beyond the requirements for the master's degree will be required.

2.5.2 Non-ME Applicants within CU

All current CU undergraduate students outside the Department of Mechanical Engineering interested in a non-BAM graduate ME program are required to apply via the Graduate School application process. Please see the mechanical engineering graduate admission pages for more information.

2.6 Certificate, Non-Degree, and Continuing Education Programs

2.6.1 Mechanical Engineering Certificates

The Department of Mechanical Engineering offers four graduate certificates:

- Advanced Mechanics and Failure Analysis
- Biomedical Engineering
- Food Engineering
- Mechanical Design and Product Development.

Internal applicants who are currently-enrolled graduates students or BAM students in graduate standing at CU Boulder in engineering, sciences, or mathematics and have a 3.0 CGPA or higher are eligible to apply by completing this certificate application form.

Nondegree students will need to submit the following application items in the Nondegree Graduate Certificate Application Form.

- Statement of purpose: One page explaining how the graduate certificate will benefit your professional and/or personal interests.
- Resume or CV
- Unofficial undergraduate transcript. If you have a graduate transcript, you may submit that as well.
- Language scores (required only for international applicants)

For more information, please visit the Graduate Certificates webpage, email megrad@colorado.edu, or go to Section 6.4.

2.7 Finding an Advisor

For PhD students, it is extremely helpful to begin your first semester having already arranged to work in a research lab, or to secure one within the first month of classes. Students interested in the MS Thesis program can utilize the resources in this section, but should note that, in nearly all cases, a research advisor is not procured until after matriculation. Please review our faculty website for more information.

An excellent opportunity for admitted applicants to meet with potential advisors is during the department's annual GEARRS event for PhD students and MS Visit Day for students interested in the MS Thesis program.

Below are a few tips as you discover what research group is the best fit for you:

- Investigate many different advisors, but keep in mind that some lab websites are not up to date with the most current research, so make sure to email and ask professors about their current work.
- Ask for contact information of lab group members and get their input on the strengths and weaknesses

of their lab.
- Ask about what your role as a lab member may look like.
- Share your long-term goal for your PhD, even if you haven't yet figured out how to accomplish that goal. Professors love to hear what you are passionate about.
- Ask questions! Remember it is just as important to find a lab culture that is a good fit for you as it is to find a research topic that is interesting. We recommend asking questions like the following to both faculty and current graduate students.

Questions to ask a potential advisor:

- Are you taking new students?
- What would my role as a lab member look like?
- How many graduate students and post docs are currently in the lab?
- How would you describe the lab culture?
- What makes someone a good fit for this group?
- How would you describe your advising style?
- How would you describe graduate school in general?
- Do you collaborate with other research groups on or off campus?
- Is there funding for the project that I am interested in?
- Do you expect your students to apply for external funding?
- How many years do graduate students in your lab typically TA?
- How often do you meet with your students?
- How often do students attend conferences?
- What professional development opportunities are there in the lab?
- How do you feel about students taking a summer to do an internship?

Questions to ask other graduate students in the lab:

- Is the PI accessible?
- How would you characterize the PI's advising style (e.g. hands on, hands off)?
- Does the lab group do any activities together throughout the year?
- What are other student's technical backgrounds?
- What makes someone a good fit for this lab?
- How did you decide to join this lab?
- What do you like most about working in this lab group?
- Are there aspects of this group culture that you wish you could change?

3 Tuition, Fees, and Funding

3.1 Overview

We recognize that the cost of studying and living in Boulder is a consideration for students of all levels. Although tuition and fees are set by the university, in the department we attempt to provide as much financial support as possible for our graduate students. This support includes multi-year teaching and research assistant (TA and RA, respectively) appointments, hourly employment opportunities, and travel grants for students giving presentations at conferences.

3.2 Tuition and Fees

Because tuition and fees are charged at variable rates based on residency, program, student status, and number of enrolled credits each semester, a good understanding of the structure of tuition and fees can help to maximize the return on educational investment.

Detailed information on tuition and fees is available on the CU Bursar Office's website. After choosing the appropriate semester on this page, PhD and MS Thesis student tuition rates are listed under the "Graduate" heading, while MS Professional tuition rates are listed under the "Professional Graduate" heading.

Fees are determined based on a number of factors. To determine the fees for which you are responsible, first identify your graduate status on the Graduate School website. Then, a full list of mandatory fees, by graduate status, can be found on on the fees section of the Bursar's Office website.

Important tuition and fee policies to note are:

- Fees accompany even 1 credit hour of tuition and should be taken into account when calculating educational costs.
- New domestic PhD students, including current CU students switching into the PhD program, are required to establish Colorado residency within 1 year of starting the PhD program. Further details on the requirements to establish residency are provided in Section 3.3.
- New domestic non-resident MS Thesis students, including current CU students switching into the MS Thesis program, are highly recommended to establish Colorado residency in their 2nd year or 3rd semester of their MS Thesis program. Further details on the recommendation and difference of tuition rates between non-resident and resident thesis are provided in Section 5.4.2.
- Students must be enrolled in classes during the first semester in which they enter a new degree program, requiring the payment of tuition and fees. For this reason, it is uncommon (although not impossible) for students to start new degree programs during summer terms.

Further questions about tuition and fees can be directed to the graduate advisors at megrad@colorado.edu.

3.3 Establishing Residency

New domestic PhD students who are not already Colorado residents must establish residency prior to the beginning of their second year. New domestic non-resident MS Thesis students, including current CU students switching into the MS Thesis program, are highly recommended to establish Colorado residency in their 2nd year or 3rd semester of their MS Thesis program. Further details on the recommendation and difference of tuition rates between non-resident and resident thesis are provided in Section 5.4.2. Any student wishing to establish Colorado Residency, including MS students, should take action immediately. Instructions on how to do establish residency are available on the Registrar's website. It takes exactly at least one year to gain residency and residency status may affect the possibility of future funding opportunities. Students should plan to complete the residency petition in their second semester.

3.4 Funding Overview

3.4.1 PhD Students

First year PhD students are typically funded by the department with a TA in their first two semesters. PhD students in their second year and beyond are typically funded by their research advisor(s) as an RA through support from sponsored projects, research grants, and contracts. University policy requires appointments for all graduate students be administered on a semester-by-semester basis. If students have questions about future funding, we encourage them to discuss plans with their faculty research advisor early each semester. Additional questions regarding funding can be directed to either the graduate advisors at megrad@colorado.edu or the graduate program chair.

In cases where funding for a current PhD student has not been secured or is not possible via other sources, the research advisor can apply for departmental support on the student's behalf. If approved, this funding will likely be in the form of a TA, unless it's the semester of a student's dissertation defense. The Application for Departmental Support is available to faculty each semester, including summer. The Graduate Committee reviews applications for departmental support with consideration for availability of funds, previous history of departmental support for the student, and the faculty member's financial need. Further detail on this application process is provided in Section 3.9.

3.4.2 Master's Degree Students

Students admitted to the master's degree program, including BAM students, are expected to secure their own financial support. Although the department does offer a number of scholarship opportunities, detailed in Section 3.6, recipients will still be expected to cover the majority of their cost of attendance either independently or via external sources. Scholarship application requirements and timelines may vary, but will be marketed through the Current ME Graduate Student Canvas Course Announcements. While MS Thesis students are eligible for TA and RA appointments, these opportunities are very rare. There is no formal application process for MS Thesis students to pursue assistantships. A student's thesis advisor, at their discretion and pending funding availability, may offer an assistantship upon demonstration of exceptional promise in research and academics.

Students in the Professional MS program are not eligible for TA or RA appointments, but are eligible for hourly employment as course assistants (CAs), administrative assistants, and research assistants. These positions do not provide coverage of tuition, fees, or health benefits, but do provide hourly pay. The Graduate Program will announce these opportunities and associated deadlines via the Current ME Graduate Student Canvas Course Announcements.

3.4.3 Sources of Funding

When making sense of different assistantships, appointments, and fellowships, it can be helpful for students to be aware of the different sources of funding that they may come across:

Funding Type	Program		
	PhD	*MS Thesis*	*MS Professional*
Teaching Assistantship	✔	✱	✘
Research Assistantship	✔	✱	✘
Chair's Graduate Assistantship	✔	✱	✘
Entrepreneurial Scholarship	✘	✔	✔
Diversity Scholarship	✘	✔	✔
University Graduate Fellowship	✔	✘	✘
Chair's Graduate Fellowship	✔	✘	✘
Tom and Brenda Geers Award	✔	✘	✘
Singh Award	✔	✔	✔
Vogel Family Fellowship	✔	✘	✘
Summer Fellowship	✔	✱	✘

Table 1: ✔ = eligible for this funding type; ✘ = not eligible for this funding type; ✱ = eligible for this funding type, but opportunities are limited/rare.

- **Departmental funding:** This funding comes directly from the department in the form of TA or RA appointments and is ultimately allocated by the graduate committee. Individual faculty advisors may be consulted prior to departmental funding decisions, but this funding does not come from sponsored projects or grants. New PhD students are often given departmental support in the form of TA positions, and the Application for Departmental Support can be used by faculty advisors to request support for current students.
- **Sponsored project and grant funding:** This funding comes from externally funded sponsored projects and grants connected, for example, to the National Science Foundation (NSF), the National Institutes of Health (NIH), and the Department of Defense (DoD). Such funding is nearly always used to support RA appointments, with final funding decisions made by individual faculty advisors. Although "gift" funding is contractually different than funding from sponsored projects and grants, it is also typically disbursed by individual faculty advisors in the form of RA positions.
- **Startup funding:** In some cases, students may hear about "startup" funding, in the form of either TA or RA appointments, that faculty may have access to. These are positions promised to faculty by the department but, in contrast to "departmental funding", individual faculty advisors are responsible for deciding when and how to use these positions.
- **Fellowship funding:** This funding is provided by external sources such as the NSF, NIH, or DoD in the form of graduate fellowships (Section 3.8 provides more detail on different types of fellowships). In some cases this funding may be connected to a particular faculty research advisor, but generally students receiving this funding are not contractually obligated to a particular sponsored project, grant, or advisor.

3.4.4 Funding Eligibility Quick Guide

To aid students in finding funding opportunities within the department, we have prepared a funding eligibility quick guide, shown at the top of this page as Table 1. Detailed descriptions of each opportunity are provided in the following sections.

3.5 Assistantships

Assistantships are the primary mechanism for financially supporting PhD students. Recipients are awarded coverage of tuition, 91% of university health plan costs, dental insurance, and a living stipend in the form of a monthly salary. Students on an assistantship are required to work, either in a teaching or research capacity, for up to 20 hours per week during the fall and spring terms. During the summer term, students are eligible to receive assistantships with a 40 hours per week work commitment and an increased living stipend, although this is very rare and the large majority of students remain on a 20 hour per week appointment throughout the year. Details of assistantships can vary depending on your faculty advisor; we recommend that all current

and prospective students communicate regularly with their faculty advisor about expectations for assistantship funding.

All PhD students are eligible for assistantships. While eligible, MS Thesis students receive assistantship funding on a very limited basis. MS Professional students are not eligible to receive assistantships from any department. Further information on appointments is available in the CU Graduate Student Appointment Manual.

3.5.1 Teaching Assistantships

Teaching assistants (TAs) play a vital role in supporting the educational mission of the department and the College of Engineering and Applied Sciences. Under the mentorship of faculty, students have the opportunity to develop their pedagogical skills and further enhance their knowledge in the engineering field. Extensive information and resources for TAs are available in Appendix F.

In most cases, TAs will be assigned to support an undergraduate mechanical engineering course. However, in limited cases, some students may support graduate-level and/or courses outside the department.

The number of TA hours allocated to each course is dictated primarily by the number of students enrolled in the course. TA assignments are made by the graduate and undergraduate chairs and graduate advisors with input from instructors, PhD advisors, and students. Prior to assignment of TAs, a survey is sent to students requesting course preferences and, in nearly all cases, TAs are assigned to one of their top-three preferred courses.

3.5.2 Research Assistantships

In most cases, research assistants (RAs) are funded directly by faculty through sponsored project or grant funding. As such, specific duties will vary based on the nature of the research and the faculty member. In conjunction with the PhD curriculum, research assistantships provide broad exposure to the research process from grant proposal to publication.

In addition to faculty funded research assistantships, PhD students may be offered a special assistantship in recognition of their outstanding potential. All PhD applicants are automatically considered for special assistantships with their application for admission. Current PhD students are not eligible to be considered for special assistantships.

3.5.3 Compensation Rates

Monthly stipend compensation rates for student assistantships, based on PhD student status, are the following:

- *Pre-comprehensive exam:* $3,353 per month
- *Post-comprehensive exam:* $3,605 per month

Additional detail on these PhD student statuses is available in Chapter 4. MS Thesis students with RA/TA appointments are paid at the pre-comprehensive exam compensation rate.

3.5.4 English Language Proficiency Requirement

International students assigned as RAs or TAs are required by the College of Engineering and Applied Sciences to take an English language screening test, administered by the International English Center and described in more detail on the International English Center course description page. If a student fails this test, they may either be recommended or required to take the course ELSG 1130: Pronunciation for International Graduate students. This course is designed for international graduate students who want to polish and refine their spoken English skills. For students required or recommended to take this course, the cost of the course will be fully covered for them.

3.6 Scholarships and Fellowships

3.6.1 MS Departmental Scholarship

We are committed to fostering a diverse and equitable environment for our students in all respects, inclusive of financial support. The MS Departmental Scholarship will be awarded to MS students who meet eligibility

criteria and have outstanding merit. Awards are in the amounts of 500−5,000.

3.6.2 MS Support Award (Dana Shinn Award)

Mechanical Engineering MS students (including BAM) are invited (via Canvas announcement) to apply for travel support made possible by a generous donation from the Mechanical Engineering Strategic Advisory Board (MESAB) member Dana Shinn. These awards aim to facilitate professional development by helping cover costs for conference participation, paper/poster presentations, or similar events.

3.6.3 Singh Graduate Fellowship

Shrawan Kumar Singh and Sudha Singh have generously established a fellowship intended to provide financial support to mechanical engineering students pursuing graduate studies within the department. Students that have research interest in bioengineering and/or biomechanical studies are given preference for this fellowship. Award amounts and lengths may vary. Students will automatically be considered for this fellowship by the graduate committee and departmental leadership.

3.6.4 Tom and Brenda Geers Graduate Fellowship

Thomas L. and Brenda Geers have generously established a fellowship intended to provide one student pursuing a PhD in mechanical engineering with fellowship support. Students who are pursuing work in solid and/or fluid mechanics that have attained post-prelim status are eligible for the fellowship. Possible fellows are considered automatically by the graduate committee and may be awarded a fellowship for up to three years. Award amounts may vary and only one student at a time can be designated a Geers Fellow.

3.6.5 Vogel Family Fellowship

Herbert and Karen Vogel have generously established a fellowship intended to provide one mechanical engineering student pursuing research in the area of thermodynamics, heat transfer or fluid flow with fellowship support. Possible fellows are considered automatically by the graduate committee and may be awarded a fellowship for up to three years.

3.6.6 University Graduate Fellowships

University Graduate Fellowships are awards supported by the University of Colorado and the Graduate School. PhD applicants are automatically considered with their application for admission. University Graduate Fellowships are awarded to the top applicants for each incoming class of PhD students. Fellowship amounts can vary, with a maximum award of $5000 per year. These awards are provided in addition to the tuition, health insurance and living stipend provided by a student's assistantship.

3.6.7 Chair's Graduate Fellowships

Chair's Graduate Fellowships are awards supported by the Department of Mechanical Engineering. PhD applicants are automatically considered for this fellowship with their application for admission. Chair's Graduate Fellowships are awarded to applicants that show exceptional potential during the admissions process. These awards are provided in addition to the tuition, health insurance and living stipend provided by an assistantship.

3.6.8 Summer Fellowships

PhD students who have not received an assistantship offer for the summer term who wish to continue working in their lab may be considered for a summer fellowship. These fellowship awards do not cover any summer tuition costs or health/dental insurance. The fellowship is intended to supplement summer living expenses while the student continues to support faculty research. The amount of the fellowship is equivalent to three months of pay at the rate appropriate to the status of the student (provided in Section 3.5.3).

Applications for summer fellowships are submitted using the Application for Department Support process, described in detail in Section 3.9.

Please note that students on a summer fellowship are not considered university employees. As such, they MUST be set up as a POI (Person of Interest) through the department's HR representative prior to the start of the summer semester. Failure to take this step will result in losing access to labs and other areas of campus that

require a POI or employment status, as well as inactivation of procurement and travel cards.

Additionally, students should understand that fellowships are paid in one lump sum, rather than spread throughout the summer semester. Students should plan accordingly to ensure their funds last through the summer. Pay stubs are not generated for summer fellowship students due to the nature of this type of compensation. If you have need to demonstrate your summer income for any purpose (i.e., verification of income for housing, etc.), please reach out to your graduate advisor, who will be happy to write a letter to explain the nature of your summer funding.

3.7 Hourly Employment

The department regularly employs graduate students in hourly positions. Students in hourly positions may engage in either course, research, or administrative support. Compensation rates vary by position. However, these positions do not provide coverage of tuition, fees, or health benefits.

Hourly positions typically span 5-20 hours per week during the academic year and up to 40 hours per week during the summer. Students in hourly positions are not permitted to work more than 20 hours per week during the academic year or 40 hours per week during the summer.

Hourly employment is available for any graduate student who is not funded through a TA or RA position or similar external funding, though requirements can vary based on position. Hourly pay for a research project requires the commitment and support of a faculty advisor.

The graduate program typically requests students interested in hourly-paid course assistant (CA) roles to complete the CA Interest Form that is announced via the Current ME Graduate Student Canvas Course Announcements. Announcements of hiring usually occur three times per year; once each in Fall, Spring, and Summer semesters.

Occasionally, additional hourly employment opportunities arise on an ad-hoc basis. Any such opportunities will be marketed to students through ME Graduate Student Canvas announcements.

3.8 External Funding and Fellowships

A short list of funding opportunities that mechanical engineering students have applied for in the past are listed below. This list does not encompass all external funding opportunities. Faculty advisors may also have more information about external funding opportunities for specific fields of study.

- National Science Foundation Graduate Research Fellowship
- National Defense Science and Engineering Graduate Fellowship
- NASA Earth Science Fellowship
- Blue Waters Graduate Fellowship
- Draper Fellow Program
- Interdisciplinary Quantitative Biology Fellowship
- National Institutes of Health F31 Fellowship
- National Institutes of Health Training Grants through other CU departments

Additionally, the graduate school provides an extensive list of funding opportunties.

3.9 Application for Departmental Support

The Application for Departmental Support is for faculty advisors of mechanical engineering PhD students to request departmental support (in the form of either department-supported TA or RA positions). Selection of students for financial support is based on need, prior departmental support received by the student, merit, and the availability of funds. Preference will be given to currently enrolled PhD students, although applications may be submitted and will be reviewed for MS Thesis students. Typically, 5-10 such awards are offered per semester, including the summer.

Note that this application process is specifically intended for non-1st year PhD students who may have a gap

in funding or another reason for requiring departmental support. If a student did not receive a department-supported TA or RA position during their first year (e.g., the student was supported on an NSF fellowship or sponsored project RA), that should be noted in the application and will be taken into consideration.

Support provided through this application process is only for one semester at a time. Separate applications must be submitted to request support in future semesters. There are three review cycles for departmental support per year, corresponding to support during fall and spring semesters, and the summer.

Questions about this process may be directed to the graduate advisors at megrad@colorado.edu. PhD students who would like to receive department support but who do not have a faculty advisor should contact the graduate advisors.

3.10 Travel Awards

There are many travel award opportunities available to graduate students. Deadlines for these grants are communicated via the graduate student listserv whenever possible and can be checked at the links below.

- **Department Travel Grant:** The Department of Mechanical Engineering accepts applications for travel grants for up to $250 for in-state conferences and up to $750 for out-of-state conferences. Students are eligible to receive one travel award per academic year. Applications are accepted throughout the academic year (July 1 - June 30) and are reviewed by the Graduate Committee. Students approved for awards during the summer semester will receive the funds in the following fall semester. Funds are limited, so applying early is encouraged.
- **GPSG Travel Grant:** GPSG awards funding (up to $500) to individual graduate students each academic semester to support travel to academic conferences, meetings, or other events related to the student's studies.
- **Graduate School Travel Grants:** This grant has three application cycles per year for domestic (including Mexico and Canada) and international (excluding Mexico and Canada) travel. The dates for the application cycle can be found in the link above. All applications open at 12:01AM MST on the open date and close at 11:59PM MST on the date listed. If you received travel grant funding from the Graduate School during the last application cycle (May for current fall applicants, November for current spring applicants) you may not apply during this cycle. Masters students can receive travel funding once, and PhD students can receive funding twice during their studies at CU. The Graduate School provides a travel grant of $300 for domestic conferences and $500 for international conferences.
- **Dean's Travel Grant:** Graduate students must first apply for, and be denied, funding through the Graduate School before submitting this application. Applications must be submitted a minimum of 2 weeks prior to travel departure to allow for processing time.

3.11 Other Funding Opportunities

3.11.1 Distinguished Dissertation Award

Each year, the department awards the PhD student with the most outstanding dissertation the Distinguished Dissertation Award. The award recognizes the recipients excellence in research and scholarship and provides a $1,000 award. Students selected for this award are also entered into the College of Engineering Distinguished Dissertation Award competition.

3.11.2 Thesis/Dissertation Printing

The department covers the costs of printing and binding one copy of any mechanical engineering graduate student's final thesis or dissertation, (up to $75). This copy is intended to remain with the student for their personal use. After you submit your thesis (and it has been accepted) on ProQuest, you have the option to have it printed and bound. You will need to pay for it (and any other prints/binding that you would like) upfront and keep the receipt. Send the receipt of purchase to megrad@colorado.edu. The reimbursement will be assessed

directly to your student account.

3.11.3 Compensation for Service Leadership

Graduate students play a pivotal role in recruitment and administrative service leadership efforts across the department. In recognition of these contributions and time expended, these student leaders are offered compensation in the form of a stipend. Below are a list of leadership roles that recur on a yearly basis and the compensation for said role.

- **Graduate committee student representative:** $500 per semester of service
- **GEARRS co-presidents:** $750 per semester of service
- **GEARRS committee leads:** $300 per year of service
- **Oral preliminary exam subject area leads:** $250 per year of service

Ad hoc service leadership positions may be available on an irregular basis depending on departmental needs; in those cases, compensation will be provided for substantial contributions and time commitment as well; those rates will be provided to the student prior to accepting the leadership role.

3.11.4 Student of the Month

The graduate program will name one Student of the Month for each month of the academic year (September - May). Nominations may be submitted by any student, staff or faculty member in the mechanical engineering department via the Student of the Month form. Recipients will be acknowledged on the department website and will receive a $200 award. Students are eligible to be named student of the month on multiple occasions, though preference will be given for students who have not previously received the recognition. If you have questions about the Student of the Month, please reach out to the graduate advisors at megrad@colorado.edu.

3.12 Taxes

Graduate students are responsible for taxes according to the rules and regulations of the Internal Revenue Service (IRS). Graduate advisors and financial staff in mechanical engineering are not trained or able to provide advice on taxes, but substantial info is available through the Bursar's Office. Note that there may be special requirements for international students.

3.13 Pre-Enrollment Pay Policy

Faculty will occasionally invite incoming PhD or MS Thesis students to begin working in their lab prior to the student's first term of enrollment at CU. In these cases, students are eligible to be paid as an hourly employee, but are not eligible for an RA appointment.

Students are admitted to the department for the term in which they apply. Changes to this start term, after an offer of admission has been delivered, will not be permitted for the sole purpose of pre-enrollment employment.

3.14 Important Note on Full-Time Status and Financial Aid

The Graduate School's definition of full-time student status can vary from the requirements for full-time student status in regards to financial aid. If you have any funding from outside the department or your research group, it is important to ensure you communicate with the financial aid office and funding sponsors about possible enrollment requirements you may be subject to. This is also true if you are deferring any student loan payments from previous degrees. In both cases, enrollment requirements may be higher than the Graduate School requires.

4 PhD Degree Program

4.1 Overview

The PhD program in mechanical engineering is available to students who are entering graduate studies for the first time (with only a bachelor's degree), as well as to those who already have a master's degree. PhD students without a prior MS degree are able to earn one on the way to their PhD degrees. Many incoming PhD students will have prior degrees in some type of engineering, although students from other fields, such as physics, mathematics, biology, and chemistry, are also routinely admitted and can acquire any missing background material during the course of their PhD studies at CU. Students graduating with a PhD from mechanical engineering are expected to have extensive fundamental and foundational knowledge in their field of study, in addition to being research experts.

4.2 Mission Statement

The primary objective of the PhD degree program is to educate students to the highest levels of their chosen field, in order to make lasting and significant impacts to fundamental knowledge, technology, and society through their research. PhD students are expected to become domain experts and to complete research that can withstand the rigorous test of external peer review. Graduates from the PhD program go on to careers in industry, academia, and the public sector, and are expected to become leaders in their respective fields. Each PhD graduate is a lifelong representative of CU and the Department of Mechanical Engineering and, as such, is expected to act professionally, ethically, and with integrity during their time at CU and beyond.

4.3 Timeline

A PhD student entering without prior graduate coursework will typically take 5 years to complete the PhD degree. However, it is not uncommon for students to finish both earlier and later than this five-year average. A student entering the PhD program with prior graduate coursework from another university may be eligible to transfer up to 21 credit hours to CU and can typically finish in 3-4 years. Regardless of the time taken to complete the PhD, the primary emphasis is on remaining at CU long enough to complete high quality research that satisfies the requirements of the PhD dissertation and defense. If a student is nearing the completion of their 6th year in the PhD program, they are required to file a time-limit extension via this online form. Please contact the graduate advisors at megrad@colorado.edu for more information on requesting a time limit extension.

4.4 Requirements

Table 2 provides a description of each major requirement leading to completion of the PhD degree in mechanical engineering. Student must also adhere to the Graduate School's graduation requirements.

Requirement	Notes	Typical completion
Pre-comprehensive exam student status		
Mathematical proficiency	B- or higher in MCEN 5020: Methods of Eng. Analysis	End of 1st semester
Research group selection	Research expectations form	End of 1st semester
Research development	B- or higher in MCEN 5030: Intro. to Research	End of 1st semester
Prelim exam foundations report	Written deliverable	End of year 1
Prelim exam oral defense	30 min fundamentals, 1 hour research	During year 2
Course hours	30 hours, with 9 hours of MCEN classes	End of year 2
Comprehensive exam	Oral presentation and report	During year 4
Post-comprehensive exam student status		
Dissertation hours	30 hours	End of year 5
Written dissertation	Completed 2 weeks before defense	End of year 5
Dissertation defense	Oral presentation	End of year 5

Table 2: Requirements leading to the PhD degree, including typical completion dates and updates to student status. Dates listed are typical for completion.

4.4.1 Course Requirement

PhD students must complete a minimum of 30 graduate-level credits at the 5000 level or higher. Students entering the PhD program without an MS are required to meet the course requirements of the mechanical engineering professional MS degree: 30 credits of graduate coursework, 18 of which are in mechanical engineering (denoted by the "MCEN" course prefix). Students entering the PhD program with an MS must complete at least 9 mechanical engineering graduate course credits.

All PhD students are required to take the following courses in their first year in the program:

- MCEN 5020: Methods of Engineering Analysis I (3 credits);
- MCEN 5030: Introduction to Research (3 credits); and
- One graduate core course (3 credits) from the list below:
  - MCEN 5228 Advanced Dynamics (Spring)
  - MCEN 5228 Design Research Theory and Methods (Spring)
  - MCEN 5021 Fluid Dynamics (Fall)
  - MCEN 5042 Heat Transfer (Spring)
  - MCEN 5024 Materials Chemistry and Structures (Spring)
  - MCEN 5023 Solid Mechanics (Fall)
  - MCEN 5022 Classical Thermodynamics (Spring)

Some research advisors will require that their students complete more than 30 course credits. The graduate program recommends that, in addition to their graduate advisor, students consult their research advisor regarding any coursework recommendations or requirements. Additional detail on ME graduate courses is available on the ME Courses website.

In order to receive credit towards the PhD, students must receive a grade of at least B- in each course taken. Courses in which a grade below B- is achieved cannot be counted towards the PhD course requirement. Courses taken on a P/F basis cannot count towards the PhD course requirement.

Students must have a cumulative 3.0 GPA in order to be eligible for graduation. However, a 3.25 GPA is required for students to be eligible for Teaching or Research Assistantships.

4.4.2 Transfer Credit

Although students do not need an MS degree to be admitted to the PhD program, students who already have an MS degree, or have completed eligible graduate level coursework, may transfer up to 21 hours of credits towards the PhD course requirements. More information is available on the second page of the Request for

Transfer of Credit Form from the CU Graduate School. To transfer credits, students must fill out and submit this form to their graduate advisor at megrad@colorado.edu with an official transcript(s) included.

Requests for transfer credit can only be made after completing 6 credits of graduate level coursework at CU. These requests should be submitted as soon after completion of this 6 credit requirement as possible. Typically, this means that transfers of credit are processed during the second semester of PhD study at CU. Additional information on transfer of credits is available in Section 6.7 of Chapter 6.

4.4.3 Mathematical Proficiency Requirement

All PhD students are required to take MCEN 5020: Methods of Engineering Analysis and to pass with a grade of B- or higher. Students receiving a grade below B- in MCEN 5020 must retake the course.

PhD students will not be able to advance to post-comps status until the mathematical proficiency requirement has been completed. Failure to complete this requirement by the end of the second year of the PhD may result in removal from the PhD program.

4.4.4 Research Expectations Form

The Research Expectations Form is intended not only to formalize the agreed-upon relationship between research advisor and student, but also to assist with strategically designing the curriculum and research goals of your PhD program. The form can be found in the ME Graduate Student Resources Canvas under the "PhD Forms" module and should be completed as soon as you find a research advisor, and no later than the end of your first semester in the PhD program. This form is also a required element in MCEN 5030: Introduction to Research, which is used to satisfy the Research Development requirement (see Table 2).

Students will need to work with their research advisors to identify the oral preliminary exam topics they plan to take, any core foundational coursework they need to complete, and expectations for funding during their first year, inclusive of the summer term.

PhD students are eligible to work with research advisors at CU outside the Department of Mechanical Engineering (e.g., professors in aerospace engineering sciences or civil engineering); in such cases, the advisor consent form must still be completed in its entirety.

In the event that a PhD student has two or more faculty members serving as co-research advisors, one co-advisor should be chosen to serve as the primary administrative advisor. This faculty member will serve as the named professor for dissertation hours enrollment and, upon completion of the dissertation, will need to sign off on a final grade (in consultation with the co-advisor) for those credits.

4.4.5 Research Development Requirement

The Department of Mechanical Engineering is committed to educating well-rounded PhD students who are prepared to excel in their chosen professional careers after graduation, whether in industry, academia, or the public sector. Throughout the academic year, the department offers a wide variety of seminars, colloquia and workshops that assist in the professional development of students beyond the classroom and lab.

Our commitment to the research and professional development of our PhD students is codified by the Research Development requirement, which is fulfilled by obtaining a passing grade (i.e., B- or above) in MCEN 5030: Introduction to Research. This course, offered every fall semester, provides a strong foundation in a variety of topics related to research that will prove valuable both as a student and professional. Covered topics include ethics in research, literature review, and grant writing, among others. The Research Development requirement must be completed before proceeding to post-preliminary exam status.

4.4.6 Preliminary Exam

Overview: The Mechanical Engineering preliminary examination (prelim exam) is a rigorous, multi-stage process designed to assess a doctoral student's preparedness for independent research. The exam challenges students to demonstrate mastery of foundational knowledge in their area, a deep understanding of scholarly liter-

ature, and the ability to design and articulate a meaningful research agenda.

This process consists of two integrated stages:

- a written scholarly foundations assessment and
- an oral preliminary exam.

Together, these elements are designed to evaluate the student's knowledge and research readiness as well as their capacity for critical synthesis and technical communication.

Exam Purpose and Scope: The primary goals of the prelim exam are as follows. First, it ensures that students possess a strong conceptual and theoretical grounding in the fundamental areas of Mechanical Engineering most relevant to their focus area(s) and intended research. Second, it assesses students' abilities to conduct a structured and critical engagement with, and synthesis of, scholarly literature. Third, it provides an opportunity for students to define and communicate their planned research direction, including a rationale for their contribution to the field. By completing the prelim exam, students demonstrate that they are capable of transitioning from coursework to research, and from knowledge acquisition to knowledge creation.

Examination Committee: The committee shall consist of the student's primary advisor and two additional faculty (out of the three members, at least two must have appointments in Mechanical Engineering).

Timeline: The first component of the exam is a written scholarly foundations report. The topic(s) will be decided via discussion with the student's primary advisor in the late spring to early summer of their first year. The scholarly foundations report is due August 15 prior to the student's second year in the program. In addition to the report, the student must also submit their course completion plan.

The exam committee members will independently review and evaluate the submission by September 15. Each committee member provides written feedback, which is compiled by the primary advisor and shared with the student at the Annual Doctoral Progress Meeting no later than October 1.

Students must write a rebuttal that addresses the feedback provided by their committee on the initial scholarly foundations submission and revise their scholarly foundations report in response to committee feedback. This is akin to the standard process of revising a manuscript in response to peer review.

Students must complete the oral preliminary exam between October 15 and April 15 of their second year. Students must prepare a presentation containing two sections: 1) Scholarly Foundations (15 minutes) and 2) Research Proposal (30 minutes). The following documents must be shared with the Examination Committee at least one week prior to the oral exam:

- Revised Scholarly Foundations Report
- Rebuttal
- Research Proposal
- Course Completion Plan

Additional details on the preliminary exam, including the rubric by which students are evaluated, is provided in Appendix E.

4.4.7 Comprehensive Examination

Students must complete a comprehensive exam at least 6 months prior to defending their PhD dissertations. At the time of the comprehensive exam, the dissertation committee will be formed and given preliminary approval by the Department and Graduate School.

A mechanical engineering PhD degree requires depth of knowledge in the dissertation/research area, as well as breadth of knowledge across the mechanical engineering curriculum. Consequently, the comprehensive exam is designed to test student knowledge of their proposed research area, and any general knowledge in the field. It is also intended to evaluate whether a student's proposed research project is original and creative work,

whether it will make a significant impact in the field, and whether it will qualify for publication in quality peer-reviewed journals. The exam is also an opportunity to demonstrate an ability to present scientific concepts orally. In short, the comprehensive exam serves as the gateway to the next phase of the doctoral program: completion of a dissertation.

The comprehensive exam consists of the following core requirements:

- Complete the online Candidacy Application for Advanced Degree at least three weeks prior to your exam date.
- Email the exam committee information to megrad@colorado.edu at least 3 weeks prior to your exam date. The committee must be approved by the Graduate School and the graduate advisor will initiate the doctoral exam report form on the student's behalf. The following details should be included in the email:
  - Student ID Number
  - Exam date
  - Committee member name
  - Committee member email address
  - Committee member department affiliation
- By email, send the comprehensive exam proposal to (*i*) the examining committee and (*ii*) the graduate advisors at megrad@colorado.edu at least two weeks prior to the examination. The proposal should describe the work that has been completed to date and proposed work that will be completed for the dissertation.
- Included in the proposal should be a comprehensive literature review of the field of concentration, the subject of the dissertation, as well as a detailed timeline of work to be completed prior to the dissertation defense. In most cases, the proposal should be written in the style and format of the final dissertation document.
- Students must prepare a professional oral presentation that covers what is written in the proposal. This presentation should be 45-50 minutes in length and must be delivered at the comprehensive examination to the examination committee. The oral presentation portion of the examination is open to all students and faculty, and questions are entertained at the end of the presentation.
- The final part of the examination is restricted to only the student and the examination committee. During this portion, questions are entertained that cover the field of concentration and related fields.
- Successful candidates must receive affirmative votes from a majority of the members of their examination committee.

To define appropriate faculty membership for your committee, please keep in mind the following graduate school rules:

- If your advisor is a Mechanical Engineering faculty member:
  - 3 Mechanical Engineering faculty members (your advisor counts as an ME faculty member and as your committee chair)
  - 1 CU Boulder faculty member from another department
  - 1 additional committee member with a graduate faculty appointment. If this individual is from outside of CU Boulder, please contact the grad advisor megrad@colorado.edu ASAP to discuss their qualifications
- If your advisor is a faculty member outside of Mechanical Engineering:
  - Your faculty advisor (committee chair)
  - Your faculty advisor MAY NOT act as your committee chair AND your faculty member from another department per the Graduate School
  - 3 Mechanical Engineering faculty members
  - 1 CU Boulder faculty member from another department

Please note that a faculty member's primary faculty appointment may still be within Mechanical Engineering even if they are affiliated with a program within the College of Engineering (Environmental Engineering, Biomedical Engineering, Materials Science, etc.). If their primary appointment is within Mechanical Engineering, they do not count as an out of department faculty member.

Students who fail the examination may attempt it once more after a period of time determined by the examination committee. Additional administrative requirements of the comprehensive examination are as follows:

- All program coursework must be completed before taking the comprehensive exam.
- Students must be registered as regular degree-seeking students when they take the comprehensive exam (thus requiring a minimum enrollment of 1 dissertation credit hour).
- Each committee member must have a regular or special faculty appointment on file with the Graduate School prior to submission of the Doctoral Exam Report. Please contact the graduate advisors at megrad@colorado.edu as soon as you form your committee, and no later than 6 weeks prior to your comprehensive examination, to verify that the necessary appointments are in place. It takes 2-4 weeks to process a faculty appointment. Students should submit a recent CV for any committee member who does not have a faculty appointment to the graduate advisors as soon as possible.

4.4.8 Dissertation Hour Requirement

In addition to coursework, PhD students are required to complete 30 PhD dissertation hours. Students are not able to register for dissertation credits on their own and should submit a request for dissertation hours through the Thesis/Dissertation Credit Hours Request Form.

The following Graduate School rules apply to enrollment in dissertation hours and should be considered when determining how many dissertation hours to register for each semester:

- PhD students must be registered as full time, regular degree-seeking students at CU for a minimum of 5 dissertation hours during the semester in which they defend the dissertation.
- A student may not register for more than 10 dissertation credit hours in any one semester, including summer.
- A PhD student is required to register continuously as a full-time student for a minimum of five dissertation hours in the Fall and Spring semesters of each year, beginning with the semester following the passing of the comprehensive examination and extending through the semester in which the dissertation is successfully defended.
- Prior to passing the comprehensive exam, PhD students are considered by the Graduate School to be full-time if they are registered for at least 1 dissertation credit per semester.

There is little advantage to a student registering for more than 30 dissertation hours during the course of their PhD, and so students should attempt to complete this requirement in the semester in which they defend. Please contact the graduate advisors at megrad@colorado.edu for assistance with planning dissertation hour enrollment.

4.4.9 Written Dissertation

The written dissertation must comply with Graduate School rules and procedures in terms of format and submission. Please view the Graduate School's Thesis and Dissertation Submission FAQs for more information.

The dissertation title appears on official university transcripts and must be submitted to the Graduate School in addition to the physical signature page from the dissertation. Students are also required to submit the full written dissertation electronically at the ProQuest website. The timeline for these requirements is as follows:

- Final dissertation title submission is due about two months into the final semester.
- The oral dissertation defense must be passed shortly after this date.
- One week after the defense deadline, students must submit:
  - The written dissertation; and

  - The Thesis Approval Form, signed by the faculty advisor and one additional committee member.

Please see Chapter 3 for information on department support for dissertation printing costs.

4.4.10 Dissertation Defense

Before completion of the PhD degree, students must have their dissertation accepted for defense by the review committee. The dissertation defense may occur before or after the final electronic submission of the written dissertation to the Graduate School, but must take place prior to the end of the final semester of enrollment.

Students must then pass a dissertation defense, which is a final examination on the dissertation and related topics. In the defense, students are expected to explain their research clearly and concisely, and to discuss how it relates to other research in the field. This is an opportunity for recognition of completed doctoral work. It is also an opportunity for discussion and formal evaluation of the dissertation.

All required forms should be submitted on time according to the following deadlines:

- **To the Department:**
  - Email the exam committee information to megrad@colorado.edu at least 3 weeks prior to your exam date. The committee must be approved by the Graduate School, even if there are no changes from the comprehensive exam committee. The graduate advisor will initiate the doctoral exam report form on the student's behalf. The following details should be included in the email:
    - Student ID number
    - Exam date
    - Committee member name
    - Committee member email address
    - Committee member department affiliation
- **To the Committee:** The written dissertation should be sent as a single pdf file by email to all members of the defense committee, as well as to the graduate advisors at megrad@colorado.edu, at least 2 weeks before the defense. This deadline is intended to allow the defense committee sufficient time to review the dissertation and to formulate questions and feedback. Prior to the defense, students should contact all members of the committee to assess their areas of interest and concerns. This will help students anticipate any questions that will be asked.

Students must be registered as full time, regular degree-seeking students at CU for a minimum of 5 dissertation hours during the semester in which they pass the examination.

The examination is conducted by a committee appointed by the chair of the ME department and approved by the Dean of the Graduate School, and consists of at least five people with the following requirements:

- If your advisor is a Mechanical Engineering faculty member:
  - 3 Mechanical Engineering faculty members (your advisor counts as an ME faculty member and as your committee chair)
  - 1 CU Boulder faculty member from another department
  - 1 additional committee member with a graduate faculty appointment. If this individual is from outside of CU Boulder, please contact the grad advisor megrad@colorado.edu ASAP to discuss their qualifications
- If your advisor is a faculty member outside of Mechanical Engineering:
  - Your faculty advisor (committee chair)
  - Your faculty advisor MAY NOT act as your committee chair AND your faculty member from another department per the Graduate School
  - 3 Mechanical Engineering faculty members
  - 1 CU Boulder faculty member from another department

The chair and outside member of the committee must have regular or tenured Graduate Faculty appointments.

The other committee members must have either regular or special Graduate Faculty appointments. More than one dissenting vote disqualifies the candidate in the final examination. The committee chair and a majority of the committee must be present on the Boulder campus for the examination.

Students should coordinate scheduling the examination with the committee, and should schedule the examination for two hours. The examination is wholly oral and open to the public for the first portion of the examination.

Students must prepare and present a professional oral presentation that summarizes the dissertation. This presentation should be 45-50 minutes in length and delivered to the examination committee. The oral presentation portion of the examination is open to all students and faculty. Questions are entertained at the end of the presentation.

The final part of the examination is closed to only the student and the examination committee. During this portion, questions are entertained that cover the field of concentration and related fields. More than one dissenting vote among the committee constitutes an unsatisfactory exam. A student who fails the exam may attempt it once more after a period of time determined by the committee.

4.5 PhD Student Status

As the requirements towards the PhD degree are completed, PhD students will advance from pre-comprehensive exam status to post-comprehensive exam status. Milestones required to achieve each status are the following:

- **Pre-comprehensive exam status (Pre-comps)**: Students enter the PhD program with pre-comps status and will typically remain at this status until successful completion of the comprehensive exam in year 4. Students should complete their required courses, research development requirement, and the preliminary exam during this time.

4.6 Application for Graduation

To graduate with the PhD degree, students must complete all course and dissertation hour requirements, as well as write and defend their dissertation. Additional details on each of these requirements are provided above.

To graduate with the PhD degree, students must apply online through their Buff portal. Directions to complete this process can be found on the Registrar's website.

The application for graduation is due a few weeks after the start of the desired graduation semester. Full details on requirements and deadlines can be accessed on the Graduate School doctoral graduation webpage. If you did not submit the Candidacy Application for Advanced Degree when completing the comprehensive examination, it must be submitted electronically prior to applying for graduation online.

PhD students must be registered as a full time, regular degree-seeking student, for a minimum of 5 dissertation hours during the semester in which they pass the final exam. If a student is unable to meet the Graduate School's posted defense deadline for that semester, they should consult with their graduate advisor about graduation options.

Detailed graduation information will be communicated to all students through the ME Graduate Student Services Canvas at the beginning of each semester.

4.7 Master's Degree as a PhD Candidate

Although a Master's degree is not required for a PhD, students can earn one while working toward the PhD. This is accomplished by applying for an MS degree when 30 graduate course hours have been completed. All requirements described in Chapter 5 must be completed in order to receive the MS degree; the procedure to apply for graduation with the MS degree is also provided in this chapter. PhD students must notify their graduate advisor within the first two weeks of the semester in which they intend to graduate with the MS degree.

5 Master's Degree Programs

5.1 Overview

Master's degree students in mechanical engineering take graduate courses and participate in research and/or project based learning as part of four different program choices, each leading to a master's of science (MS) degree in mechanical engineering.

- **MS Professional:** This degree emphasizes both project-based and curriculum-driven learning. It is targeted at working engineers and undergraduates considering, or already pursuing, a career in industry, but can also be completed with the ultimate goal of matriculating in a PhD program.
- **MS Thesis:** This degree is intended for MS students interested in a short-term research experience, leading to the preparation and defense of a research-based thesis. Students receive access to high quality research and can pursue careers in industry, the public sector, and academia.
- **Bachelor's Accelerated Master's (BAM):** Current mechanical engineering undergraduate students may pursue either an MS Professional or MS Thesis degree through this program. Undergraduate students from environmental engineering and integrated design engineer major with an emphasis in mechanical engineering may also pursue this program. View the ME BAM website for more information.
- **Dual Degree in Mechanical Engineering and Engineering Management:** This program allows students to earn two master's degrees after completing 45 graduate credits. Dual degree students can pursue either the MS Professional or MS Thesis options for their mechanical engineering degree.

Many incoming MS students will have prior degrees in engineering, physics, mathematics, biology, and chemistry and can acquire any missing background material during the course of their MS studies.

5.2 Mission Statement

The graduate program is committed to educating innovative, entrepreneurial, and fundamentally knowledgeable master's students who are prepared to excel and lead in their chosen professional careers, whether in industry, academia, or the public sector. This will be accomplished through high quality hands-on, project-based education in the classroom and in-depth training in the lab, as well as through extensive professional development opportunities offered by the department, college, and university. Through online, distance, and applied courses, the graduate program seeks to cater to current professionals and non-traditional students seeking to attain a master's degree. Each graduate of the master's program is a lifelong representative of CU and, as such, is expected to act professionally, ethically, and with integrity both during their time at CU and beyond.

5.3 Timeline

Most MS Professional students complete their degree in 2 years of full-time study, although it is not uncommon to graduate in 3 semesters or to take more than 2 years, particularly if a student is also working full-time.

MS Thesis and dual degree students typically require at least 2 years to complete their degrees. BAM students may require two or three additional semesters of study beyond completion of their undergraduate degrees to complete their graduate degree requirements.

Full-time study is defined by the Graduate School as enrollment in 5 or more graduate credits per semester. Part-time study is permissible throughout the duration of the program, or for select semesters, as long as the following Graduate School requirements are met:

- Full-time enrollment for at least 2 semesters; or
- Part-time enrollment for at least 4 semesters; or
- Full-time enrollment for 1 semester and part-time enrollment in 2 or more semesters.

Master's students, whether part- or full-time, must complete their degree requirements within 4 years of their first semester of enrollment. If more time is needed, students can request a time-limit extension from the Graduate School by filing a time-limit extension via this online form. Please contact your graduate program advisor (GPA) for more information on requesting a time limit extension.

5.4 Requirements

5.4.1 Professional MS Degree Program

Students in the Professional MS degree program can enroll a flexible combination of graduate coursework (5000 level or above) and can view a list of mechanical engineering courses available to them.

All MS Professional students must complete the following requirements to be eligible for graduation:

- **Coursework:** 30 graduate-level (5000 or above) credit hours must be completed with at least a grade of C in each course. At least 18 credits must be in mechanical engineering (i.e., MCEN courses). Up to 12 credit hours may be taken outside the department, inclusive of any transfer credits applied towards the degree. Students must maintain a cumulative 3.0 GPA to remain in good standing.
- **Professional development:** Students must complete MCEN 5000 Sociotechnical Industry Skills (formerly MCEN 5208: Industry Skills) with a grade of at least C. This course is offered every spring semester and consists of a series of seminars, workshops, and projects that provide a broad overview on topics such as effective teams, project management, engineering ethics, communication skills, technical writing, budget preparation and management, leadership styles and philosophies, and career exploration. Students end the course by completing an engineering portfolio.
  - You will automatically be waived from completing this course requirement if you complete one of the following course requirements with a C or above by the time of graduation:
    - Two engineering management (EMEN) graduate courses, OR
    - 3 credits of MCEN 5930: Professional Internship AND one engineering management (EMEN) graduate course, OR
    - MCEN 5030 Introduction to Research (prior to FA24, was MCEN 5208).
  - You may apply for a waiver from taking this course if you:
    - Have completed at least 3 years of post-baccalaureate, full-time, continuous work experience related to the field of engineering, OR
    - Are a Senior Design TA/CA.
    - Your graduate advisor will post an announcement on the ME Graduate Community Canvas page about completing the waiver request form.

5.4.2 MS Thesis Degree Program

In order to enroll in the MS Thesis program, students must first secure a thesis advisor. Once an advisor has been found, students may be admitted into the MS Thesis program from the Professional MS, BAM, BS/MS, or

even PhD program by following the procedures outlined in Section 2.5.

MS Thesis students should consult with their research advisor and graduate program advisor (GPA) for course selection recommendations. Students in the MS Thesis program can enroll a flexible combination of graduate coursework (5000 level or above) and can view a list of mechanical engineering courses available to them.

MS Thesis Milestones: Beginning in Spring 2025, MS Thesis students are required to complete five Milestones that are parallel to the MS Thesis degree requirements. These milestones aid students, the MS academic advisor, and faculty thesis advisors to keep track of a student's progress in research and academics. Each milestone is outlined below and in the MS Thesis Milestone Progress Report. Finally, these milestones are helpful for any student to review if they are interested in switching to the MS Thesis program.

- **Milestone 1:** Thesis Faculty Advisor Obtainment *before end of 1st year / 2 semesters in MS Program*
  - To find ME faculty research that aligns with your interests, review: 1) faculty profiles, 2) research overview slides, and 3) recorded research information sessions.
  - Only initiate direct faculty outreach after admission to the MS Mechanical Engineering Program. When contacting faculty directly, we recommend that you provide the following:
    - Resume and/or curriculum vitae
    - Short description of research experience, research interest alignment, and potential ontributions to their Lab
    - Statement about Student Status (i.e., admitted, currently enrolled, etc.)
  - Topics to discuss with potential thesis faculty advisor:
    - Work and commitment expectations
    - Funding
    - Research and project scope
  - While searching for thesis faculty advisor, enroll in MS Thesis required courses, both offered in the fall semester:
    - MCEN 5020 Methods of Engineering Analysis
    - MCEN 5030 Introduction to Research
  - Once a faculty member has agreed to be your thesis advisor, you and your faculty advisor must submit and sign the Acknowledgement and Milestone 1 at least two business weeks prior to the current (or next sequential) term's census date.

- **Milestone 2:** Submit Plan of Study (POS) to Graduate Program Advisor (GPA) *immediately after finding thesis faculty advisor.*
  - Discuss potential classes with thesis faculty advisor and ensure that they relate to your research and meet the minimum degree graduation requirements (also see below)!
  - Plan of Study (POS) is flexible, but any changes require a new POS submitted to GPA.
  - Student must initiate submitting POS to their GPA via DocuSign Form, found at ME Forms and Handbooks website. The POS must be endorsed by the faculty advisor and then signed by the GPA.
  - MS Thesis degree requirements: Students must 1) maintain a cumulative GPA of 3.0 or above throughout the duration of the program to stay in good academic standing, and 2) complete a total of 30 graduate (5000 or above) credits with a grade of C or above in all courses. These credits must include:
    - Minimum of 18 credits from the Mechanical Engineering department (MCEN)
    - Up to 12 elective credits that align with academic and research interests.
  - MS Thesis core course requirements: Students must complete the following courses as part of their 30 graduate credits:
    - MCEN 5030: Introduction to Research (3 credits)
    - MCEN 5020: Methods of Engineering Analysis (3 credits)
    - MCEN 6959: Master's Thesis (6 credits). Students must request enrollment in these credits

prior to the add deadline of the requested semester. Information on how to do that is communicated via the ME Graduate Student Resources Canvas. Typically, students enroll in 3 thesis credits/semester in their final two semesters, when they are expected to be working on their research, lab work, and thesis defense preparation.

- **Milestone 3:** Switch Student Record Officially to MS Thesis
  - In-State Residents: Immediately after finding faculty advisor, submit Milestone 3 to notify GPA of your residency status.
  - Out-of-state/International Residents: In your graduating semester (same as Milestone 5), notify GPA by submitting Milestone 3 at least two weeks before classes begin.
  - After receiving the above, the GPA submits the Change of Program form to the Registrar's Office. This action will lead to a tuition classification change immediately for the effective term, to "Graduate/Traditional".
  - IMPORTANT: MS Thesis students are classified under a different rate than MS Professional students. See differences on the Bursar's Office Tuition and Fee Rate Sheets webpage.
    * In-state resident Graduate/Traditional (MS thesis) tuition is cheaper than MS Professional tuition.
    * Out-of-State/International non-resident Graduate/Traditional (MS thesis) tuition is more expensive than MS Professional tuition. We highly recommend that that out-of-state, domestic MS thesis students petition for Colorado residency for their 2nd year, or third semester. To qualify to be classified as a Colorado resident, an individual must have been domiciled in Colorado for at least 12 consecutive months immediately preceding the beginning of the semester for which they are seeking residency status. For example, if you are petitioning residency for Fall 2028, you must have been domiciled in Colorado since August 2027. To learn more about applying for residency, go to the Residency Guidelines webpage. International students on an F-1 or J-1 visa cannot petition for instate residency.
    * Since tuition is more expensive for non-resident thesis students, the ME Graduate Program will cover the cost difference between the Professional MS and Graduate/Traditional tuition rate with the scholarship if the student completes the following:
      · Submit a response to the MS Thesis Non-Resident Scholarship Form by the stated deadline (Once a student's program/track is officially changed to MS Thesis and student notifies GPA by email of nonresident residency status, they will receive an email from the GPA with the form link and deadline.),
      · Must be enrolled in at least 1 credit of MCEN 6959: Master's Thesis Credits (see Milestone 4) for the semester they are requesting the scholarship for, and
      · If an out-of-state domestic student, upload proof of failed/rejected petitions for Colorado residency to the form.
    * A student can opt out of this automatic switch by notifying the GPA by email at the time of receiving this milestone progress report.
  - Student must the submit the "Master's Thesis Plan Form" to declare MS Thesis plan with the Graduate School. Form and information link can be found on the Graduate School Forms webpage.

- **Milestone 4:** Enroll in MCEN 6959: Master's Thesis Credits (*typically in 2nd year/3rd semester*)
  - Request enrollment via the Thesis Hours Enrollment Request Form (announced on the ME Graduate Student Resources Canvas.) Enrollment of credits and term submitted on form should match your POS. If something has changed, you need to submit new POS at the same time as you submit your enrollment request.
  - Typically, students enroll in 3 credits in their last two semesters. Ex: If a student plans to graduate in Spring 2030, they enroll in 3 credits of MCEN 6959 in Fall 2029 and again in Spring 2030.
  - Enrollment will also need to be requested for any future semester, but this milestone is for the first

semester that enrollment is requested.
  - There is no correlation to the number of credits requested/enrolled with the hours spent in the lab or working on thesis. An agreement on an expected timeline should be set by the faculty advisor and student. We strongly recommend that you begin reviewing information on the Graduate School website on thesis formatting guidelines and begin writing your thesis by this point, if not sooner. Thesis writing resources include the Grad+ Writing Support Weekly Write-In Sessions and Writing Center One-to-One Sessions.
  - The final grade for MCEN 6959: Master's Thesis Credits are withheld until the thesis is completed and submitted by stated Graduate School deadlines. In progress (IP) grades are assigned during each semester until the defense is successfully completed and the final copy of the thesis is accepted by the examination committee, at which time the final grade for all thesis hours is submitted to the Graduate School.
  - Student is advised to request and provide feedback about research progress with faculty advisor.

- **Milestone 5:** Thesis Submission, Defense, and Graduation (*graduating semester*)
  - Request enrollment via the Thesis Hours Enrollment Request Form (announced on the ME Graduate Student Resources Canvas.) Enrollment of credits and term submitted on form should match your POS. If something has changed, you need to submit new POS at the same time as you submit your enrollent request.
  - You must be enrolled in at least one credit of MCEN 6959: Master's Thesis Credits in graduating semester to defend thesis.
    - An exception to the above rule falls under a "grey area" and occurs when a student thesis defense is **after** that semester's MS defense deadline but **before** the next semester's first day of classes. Therefore, they would graduate in the semester after their defense. However, they would *not* register for credits in their graduating semester, but they would follow the thesis submission deadlines of their graduating semester. For example, a student who missed the Nov. 2028 / Fall 2028 deadline to defend but defends on January 9, 2029 (1 week before first day of classes for Spring 2029) will need to be registered in Fall 2028, but their graduation would be in Spring 2029 and they would follow the Spring 2029 thesis submission deadlines. They would not need to register for credits in Spring 2029, however.
    - Note that the summer semester's first day of classes is the first day of Summer Session C.
  - Typically, students enroll in 3 credits in their last two semesters. Ex: If a student plans to graduate in Spring 2030, they enroll in 3 credits of MCEN 6959 in Fall 2029 and again in Spring 2030.
  - At the beginning of your graduating semester, please review all thesis deadlines and information, which can be found on the Graduate School's website.
    - Make sure to look at the last day to defend for the semester in which you plan to graduate.
    - Speak with your thesis advisor about which faculty should be in your thesis defense committee.
  - 3-6 weeks before thesis defense date:
    - Your GPA will submit the Master's Final Examination Form on your behalf. Please email your GPA the information needed on that form, including:
      - your 9-digit student ID number,
      - you defense date and time, and
      - each committee members' 1) first and last names, 2) email addresses, and 3) CU department affiliations (ex: mechanical engineering, electrical engineering, etc.)
    - Your committee must consist of 3 members, one of whom is your thesis advisor. A minimum of 2 members must be ME faculty members with a graduate faculty appointment. If you would like a non-CU Boulder committee member to be your committee, please email your graduate program advisor their CV 6 weeks prior to your defense so that they can request a graduate faculty appointment for them.

    - Reach out to your thesis advisor and committee to schedule thesis defense.
    - Book a conference room for your defense and create a virtual defense Zoom link. Ask the ME front desk for help with booking a conference room.
  - 1 Week before Thesis Defense Date
    - Send thesis document to thesis committee members and GPA in email as an attachment or in a Google Drive document.
  - Day of Defense
    - Master's Final Exam Form: submitted by GPA to thesis defense committee. Will include satisfactory or unsatisfactory grade for defense.
    - Thesis Final Grade Report: Submitted by GPA to thesis faculty advisor and finalizes grade for all enrolled MCEN 6959: Master's Thesis credits.
    - Optional but strongly encouraged: Email thesis as a pdf to Graduate School for a pre-check before submitting final document.
  - 1 Week before Graduate School Thesis Submission Deadline
    - Thesis Approval Approval Form (TAF): Complete the landing page with your name and the names and emails of the committee chair and one other committee member. Both must sign electronically in advance of thesis submission. When the form and both signatures are complete, you will receive a pdf document via email. Please save the completed TAF as a separate, single PDF and upload as a supplementary file along with your thesis to UMI/Proquest by the submission deadline. Your submission is not considered complete without this supplementary file.
    - Thesis document: Submit thesis as a PDF, attaching the single page TAF as a supplementary file along with your thesis to UMI/Proquest by the submission deadline for Graduate School approval.

5.4.3 Bachelor's-Accelerated Master's (BAM) Program

The BAM program offers currently enrolled CU undergraduate students the opportunity to receive both bachelor's and master's degrees in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates, typically in their senior year. Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU to pursue a BAM program enables students to continue working with their established faculty mentors.

Admissions requirements and procedures for the BAM program are outlined in the ME BAM Admission website.

Early in the final semester of the undergraduate degree, students must apply to advance to graduate status by completing the Master's continuation form and the BAM supplement form. These forms are due by February 1 for spring graduates, March 1 for summer graduates, and October 1 for fall graduates. Students will matriculate into the master's program without additional departmental review provided they meet the basic continuation requirement of a 3.25 cumulative GPA. International students must have approval from International Student and Scholar Services (ISSS) prior to matriculation.

For their Master's degree, most students in the BAM program will complete the requirements of the Professional MS program outlined in Section 5.4.1. BAM students can pursue the MS Thesis program if they obtain a faculty thesis advisor as outlined in Section 5.4.2. If admitted to the MS Thesis program, BAM students should fulfill the MS Thesis degree requirements outlined in Section 5.4.2.

In order to achieve an accelerated BS/MS degree, students in the BAM program are eligible to use 6 graduate credit hours towards both the BS and MS degrees.

Substantial additional information on the BAM program can be found at the Office of the Registrar and by reviewing BAM Program Policy.

5.4.4 Dual Engineering Management and ME Degree Program

A student who is pursuing the Professional MS degree in mechanical engineering and wishes to also obtain the Master's of Engineering in Engineering Management degree must apply internally and be admitted into the Engineering Management Program. Further details on admission requirements and procedures in the dual degree program are provided on the MS ME admissions website.

In total, graduate students in the dual degree program must complete a total of 45 hours of coursework at the 5000 level or above, consisting of 21 credit hours from the Engineering Management Program (EMP) and at least 18 Department of Mechanical Engineering credit hours. Specific requirements are as follows:

- **Mechanical engineering coursework:** Students must complete at least 18 credits within mechanical engineering (i.e., MCEN courses). 6 additional credits must be completed and can be taken outside the department, if desired. The course MCEN 5000 Sociotechnical Industry Skills (formerly 5208: Industry Skills) is not required for students in the dual degree program, due to the overlap between the content of this course and the content of courses in Engineering Management.
- **Engineering management coursework:** The 21 credits required in engineering management typically consist of the following courses:
  - EMEN 5010: Introduction to Engineering Management
  - EMEN 5020: Finance and Accounting for Engineering Managers
  - EMEN 5030: Project Management; or EMEN 5031: Software Project Management; or EMEN 5405: Fundamentals of Systems Engineering
  - EMEN 5050: Leading Oneself
  - EMEN 5830: Special Topics: Engineering Communication
  - Two EMEN elective courses. Note that EMEN 5000: Engineering Analysis and EMEN 5005: Intro to Applied Statistics cannot be applied toward the Engineering Management degree.
- **Master's exam:** In Engineering Management, students must pass the master's exam in the final semester of classes or the semester after.

Additional up-to-date information on the dual degree program can be found on the the Engineering Management Program website.

5.4.5 Transfer Credit

Students may be eligible to transfer up to 9 hours of coursework to meet the Master's degree course requirements. More information is available on the Request for Transfer of Credit Form from the CU Graduate School. To transfer credits, students must fill out and submit this form to the Graduate School via DocuSign.

Please note that requests for transfer credit can only be made after completing 6 credits of graduate level coursework at CU. These requests should be submitted as soon after completion of this 6 credit requirement as possible. Typically, this means that transfer of credit requests are processed during the second semester of study at CU. Additional information on transfer of credit requests is available in Section 6.7.

5.5 Application for Graduation

In order to graduate with the Master's degree, students must apply online through their myCU portal. On the "Student" tab, select the "Apply for Graduation" link under "Academic Resources".

The application for graduation is due a few weeks after the start of the desired graduation semester. Full details on requirements can be found on the Master's Graduation webpage, and deadlines are available by selecting the appropriate semester for graduation on this webpage. For all degree programs, the Candidacy Application for Advanced Degree must be submitted to the Graduate School via DocuSign. Detailed graduation information will be communicated to all students through the graduate student listserv at the beginning of each semester.

6 Curriculum

6.1 Deadlines

The Department adheres to the deadlines and calendar established by the Office of the Registrar. The primary deadlines to be aware of, with dates that will vary by semester, are as follows:

- **Last day to add a class:** This date is typically during the second week of the semester. After this date, students can only be enrolled pending a petition to the Office of the Registrar, submitted by the Department on behalf of the student. Such requests will only be entertained in exceptional circumstances.
- **Tuition and fees payment due:** Students must pay tuition and fees, or enroll in a payment plan, by this date. This date is typically the day following the deadline for the last day to add a class.
- **Last day to drop a class:** After this date, students choosing to drop a course will receive a withdrawal (i.e., grade of 'W') on their transcripts; tuition for dropped courses will not be refunded. This date is typically during the third week of the semester.

Students should familiarize themselves with these dates, since it can be difficult or impossible to add/drop classes after the deadlines.

6.2 Adding and Dropping Courses

As noted above, students should add and drop all courses within their enrollment window, which is determined by the Registrar's office. Some courses require special application; in those cases, application details will be communicated in advance of the enrollment period via the ME Graduate Student Resources Canvas.

Thesis, dissertation and independent study credits can only be added by the Graduate Advisor. Independent study credits will be automatically added upon approval of the independent study petition, as described in Section 6.5. Thesis and dissertation hours should be requested via the Thesis/Dissertation Hours Enrollment Request Form prior to the start of the semester.

Students who wish to drop a course after the drop deadline will be required to provide a letter of explanation stating why they would like to drop the course. In order to drop a class after the drop deadline has passed, students are required to petition the Dean and provide documentation showing that there were extenuating circumstances beyond their control (such as illness, injury, a death in the family, etc.) that occurred after the drop deadline, preventing the student from attending/participating in the course for which they were registered. Please consult your graduate advisor prior to dropping a course after the drop deadline.

Students who wish to withdraw from all classes should consult the Registrar's Office website.

6.3 Transcripts

Official transcripts for current and previous graduate students can be ordered online from the Office of the Registrar. Unofficial transcripts can be downloaded anytime by students through the educational portal.

6.4 Certificates

Both degree seeking and non-degree students can pursue one of four graduate certificates in mechanical engineering. A minimum GPA of 3.0 is required to remain in good academic standing. For application and curriculum information, please visit the Graduate Certificates webpage.

6.4.1 Advanced Mechanics and Failure Analysis

The Advanced Mechanics and Failure Analysis Certificate trains students with the necessary knowledge and skills for a broad range of industrial sectors that involve structural design and reliability assessment.

9 credit hours of graduate level coursework are required to complete the certificate program with a grade of at least a B in each course.

6.4.2 Biomedical Engineering

The Biomedical Engineering Certificate trains next-generation professional engineers to interface engineering and medicine with design and problem solving to improve human health.

9 credit hours of graduate level coursework are required to complete the certificate program with a grade of at least a B in each course.

6.4.3 Food Engineering

The Food Engineering Certificate focuses on the science and engineering of foods like specialty coffee and chocolate. Students will receive both a broad overview and in-depth content on food engineering and food product design, in addition to learning about food sustainability.

9 credit hours of graduate level coursework will be required to complete the certificate program with a grade of at least a B in each course.

6.4.4 Mechanical Design and Product Development

The Mechanical Design and Product Development Certificate trains students on methods from across the field of design to create learning experiences that will directly influence their potential career path in product design and development

12 credit hours of graduate level coursework will be required to complete the certificate program with a grade of at least a B in each course.

6.5 Independent Study

An independent study course is defined as research study requiring a high level of self-directed learning. This learning requires students to read, conduct research, and complete written examinations, reports, projects, research papers, portfolios, or similar assignments that are designed to measure competency in the stated objectives. This work may be experiential, directed reading, or independent research supervised by a faculty member and approved by the mechanical engineering graduate chair.

6.5.1 Guidelines

A number of activities are specifically prohibited as independent study work. Included here are such activities as internships, volunteer or paid work in a university department, volunteer work of other kinds, work in a business, extra work in a class, and work completed elsewhere. Strictly prohibited are independent study as a substitute for a regular course offering. Independent study will normally consist of directed research which leads to the preparation of a substantive presentation of findings, usually in the form of a written paper or report. Any variation on this format must be approved by the Department graduate committee.

University rules do not normally allow Independent Study credit for internship experiences, work-study or hourly pay work done in departments, or for work also compensated by a salary. An independent study should not be used for resolving scheduling conflicts, making up failed classes or alleviating faculty teaching loads.

6.5.2 Requirements and Eligibility

The following minimum criteria must be met to ensure the overall outcomes of the educational experience, the success of the students, and compliance with accreditation standards:

- Students who take independent studies must have a minimum cumulative GPA of 3.25.
- The independent study must include comprehensive objectives in a written form.
- The independent study must demonstrate the relevance and appropriateness to the program outcomes.
- The independent study must promote a high level of self-directed learning.
- The independent study must engage students to interact with the instructor throughout the course.

6.5.3 Enrollment Procedure

The student will develop a plan or idea for independent study and will work with a faculty member to determine the feasibility and supervision of the class.

The student and the faculty member will complete the Independent Study Form, found on ME's Forms and Handbooks website including, but not limited to, the following information:

- Course description and area of study, including number of credits to be issued (1 credit hour is approximately equal to 40 clock hours of proposed independent study activity per semester).
- Learning objectives and outcomes.
- Approach to be used (directed reading, instructions and supervision, and/or lab experience, exercises and projects, etc.)
- Information on textbooks, references, and reading materials.
- Means of communication between student and faculty member throughout the course of independent study.
- Means of evaluation (one or more), typically consisting of a tangible product such as a project, presentation, written review of the literature, homework assignments or exams.
- Guidelines, schedules, benchmarks, milestones, or weekly task breakdowns throughout the semester.

When an independent study is designed and proposed, the rationale for the number of credits awarded by the course should meet the following criteria:

- 1 semester credit hour for each 40 clock hours of documented independent study activities.
- Students may only count a combined maximum of 6 credits of independent study and internship for credit toward their degree.

The completed Independent Study Agreement Form should be submitted no later than one week prior to the coures add deadline. Upon approval of the independent study by the graduate committee, the graduate advisor will add the independent study credits to the student's schedule.

6.5.4 Documentation and Assessment

Through the course of an independent study, it is the student's responsibility to communicate with the instructor and document time spent on the independent study. Activities that constitute time spent on an independent study include, but are not limited to: reading, conducting research, completing written examinations, reports, projects, research papers, portfolios and homework assignments.

To ensure proper documentation, a final report or presentation slides should be provided to the graduate advisors at the end of the semester.

6.6 Internship for Credit

This course provides students with direct access to rich learning experiences that can be provided outside of

the regular classroom where a wide variety of a coursework from multiple classes is synthesized and applied in ways and/or at scales that are not possible in a classroom setting.

Students will demonstrate expertise and integrate foundational concepts in engineering, project, and team skills during the design, development, and delivery activities in an engineering-related industrial project setting.

This course will also prepare students for professional careers in engineering-related industries.

Note that while a faculty advisor is required for each student completing the internship for credit course, ME faculty and the grad program are not responsible for organizing internships.

6.6.1 Requirements and Eligibility

The following requirements and eligibility apply to the internship for credit course:

- All internships for credit require a minimum of 150 contact hours to receive 3 credits towards degree requirements (or, 40-55 hours of work per credit).
- Students must have completed at least 1 semester in the graduate program before they can take the internship course.
- Students must have at least a 3.25 GPA to apply. Continued performance at this level is a prerequisite for beginning an internship experience.
- Students may only count a combined maximum of 6 credits of independent study and internship for credit toward their degree; if needed, students can take the internship for credit class multiple times, but can only count it once toward their degree requirements.
- PhD, MS Thesis, Professional MS, and BAM students can take the course.
- Both paid and unpaid internships are permitted in the internship for credit course.
- Regular tuition and fees are required for the course.

Additional questions regarding requirements and eligibility should be directed to the graduate advisors at megrad@colorado.edu.

6.6.2 Enrollment Procedure

This course requires an application process that must be completed and approved before the internship takes place. This application requires the following:

1. Specify details of the internship;
2. Specify and justify the specific academic goals of the internship;
3. Specify a contact at the company who will ensure the academic components of the internship are delivered;
4. Specify an ME faculty member who has agreed to review the reports generated by the student during the internship; it is this faculty member who will ultimately provide the student with a grade for this class.

6.6.3 Documentation and Assessment

Applications will be submitted via the ME Student Internship Agreement and Learning Plan DocuSign. International students must have their internship approved by an international student advisor before the first day of work.

Applications must be received at least two weeks prior to the start of the semester and/or the add deadline.

6.6.4 Documentation and Assessment

The grading approach and assignments will be determined by the faculty advisor. As an example:

- The course grade is based on weekly progress reports submitted via Canvas with information on the following topics:
    1. Summary of internship activities for the past week, including notable tasks and accomplishments;

2. Work plan for the following week, including an itemized list of objectives;
3. Specific concerns or challenges related to the internship (enter N/A if there are none).

- A one-on-one interview will be held with the instructor halfway through the course, and students will give a 20 minutes final presentation on their internship experience at the end of the semester, with 10 minutes for questions and discussion.

Regardless of the grading approach and assignments agreed upon by the advisor and student, a student evaluation of the experience is due by the grade submission deadline of the term they are enrolled in. This evaluation will be provided to students at the time of enrollment in the course.

6.7 Transfers of Credit

To request transfer credit, graduate students should complete and submit the Request for Transfer of Credit Form from the CU Graduate School. To transfer credits, students must fill out and submit this form to the Graduate School via DocuSign.

Please note that requests for transfer credit can only be made after completing 6 credits of graduate level coursework at CU. These requests should be submitted as soon after completion of this 6 credit requirement as possible. Typically, this means that transfer credit requests are processed during the second semester of study.

Transfer credits from accredited institutions are accepted by CU only after approval by the graduate chair and under the special conditions outlined below. Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a non-degree student within the CU system. Students seeking a degree from CU must complete the majority of their course work while enrolled in a graduate program as a degree seeking student.

The following rules apply to transferring credit to the CU Department of Mechanical Engineering:

1. The maximum amount of work that may be transferred to CU depends upon the graduate degree sought. Master's students may transfer up to 9 hours, while PhD students may transfer up to 21 hours.
2. Work already applied toward a graduate or undergraduate degree received from CU or another institution cannot be accepted for transfer toward another graduate degree of the same level at CU. In addition, work completed for a doctoral degree may not be applied toward a subsequent master's degree.
3. All courses accepted for transfer must be graduate level courses. The course grade must be B or higher. Transfer course work which is to be applied to a graduate degree at CU and was completed more than 5 years prior to being accepted to the program shall be evaluated by the Department as to current relevance and applicability to the degree requirements. At the discretion of the Department, a student may be asked to validate transfer credits prior to approval.
4. Credit may not be transferred until the student has completed 6 credits of graduate level course work as a degree-seeking student on the CU campus with a 3.0 GPA. Transferred credits do not reduce the minimum registration requirement but may reduce the amount of work to be done in formal courses.
5. With the exception of students enrolled in the BAM or BS/MS programs, seniors at CU Boulder may transfer a limited amount of graduate level work (up to 9 semester hours) provided such work:
   - Is completed with a grade of B or above at CU Boulder;
   - Comes within the five year course time limit;
   - Has not been applied toward another degree;
   - Is recommended for transfer by the department concerned, and such transfer is approved by the Dean of the Graduate School.

6.8 Curriculum Changes

Students seeking to waive a curriculum requirement or substitute a course should submit a petition to the Graduate Committee using Graduate Committee Petition. The petition should contain the reason(s) for the request, i.e. what action the student is requesting the Graduate Committee to take, and include detailed infor-

mation about why the request should be approved. Supplementary materials such as course descriptions or syllabi may also be included. All petitions should be routed through the graduate advisor.

6.9 Course Repetition

A student who receives a grade of C+ or lower can request to retake the course for grade replacement. Full details and requirements are available on the registrar website.

6.10 Change of Record

Change of record requests are required for past-term student record changes and for current-term enrollment requests after add/drop deadlines. Some examples where a change of record request should be made include:

- Any academic record change after the last day of classes (e.g., add, drop, change grading basis or variable credits, expunge, etc.)
- Add a student to a class after the Monday before finals. In such cases, the change of record request must include the student's final grade, because the student will not appear on the grade roster.

Change of record requests can only be made with the graduate advisors and consent of the graduate chair. The department must submit appropriate documentation directly to the Registrar's Office. This office will not accept a student-delivered change of record request. Please reach out to the graduate advisors with any questions about this process.

6.11 Dissertation/Thesis Hour Level Change Requests

MS Thesis students who are admitted to the PhD program prior to completing the MS degree can petition the graduate committee to change up to 6 thesis hours to dissertation hours by submitting a Graduate Committee Petition. The petition should demonstrate that the research completed while enrolled in thesis hours directly relates to the proposed dissertation research.

Similarly, PhD students who switch to the MS Thesis program may petition the graduate committee to change up to 6 dissertation hours to thesis hours by submitting a Graduate Committee Petition. The petition should demonstrate that the research completed while enrolled in dissertation hours directly relates to the proposed thesis.

6.12 Auditing Courses

Degree seeking students cannot audit courses. Students can register for NC (no credit), but will need to pay full price for the course. Please note that for students on a TA or RA appointment, the appointment will not cover the tuition cost of a course taken for no credit.

6.13 Grades of 'Incomplete'

To receive a grade of "I" (or incomplete), the student must receive the consent of the instructor and be able to demonstrate that for documented reasons beyond the student's control, the student was unable to complete course requirements during the semester enrolled. Students are given one year to complete the requirements for the course and receive a letter grade; after one year the incomplete grade automatically changes to an "F".

6.14 4000/5000 Level Courses

The CU Graduate School requires that there be a difference between 4000 and 5000 level courses that are taught as a combined 4000/5000 section. Students registered at the 5000 level are taking the course for graduate level credit, and thus the course expectations of that student must be at the graduate level. Conversely, students registered at the 4000 level are taking the course for undergraduate level credit, and thus the course expectations must be at the undergraduate level.

Course instructors are advised to keep track of the course requirement differences between the 4000 and 5000 level students. An ideal location to document this difference is in the course syllabus. In recent years there have been instances where a student requested changing course credit from 4000 to 5000 level, or vice-versa. The University allows for this change if the student's grade can be adjusted (or additional requirements met) per

documentation provided by the course instructor. One example is where a BS/MS student enrolls in a course at the 4000 level, and after completion requests a change to 5000 level, due to some unforeseen event. In this example, the course instructor is approached to determine a grade change, or asked if additional coursework needs to be completed. While it is up to the course instructor on how to proceed, having a documented difference that can be referenced can save the course instructor significant time, in addition to adhering to Graduate School requirements.

Course instructors should adjust their course requirements as to best fit their course. A graduate level course generally encourages deeper thought, additional workload, and/or higher expectations of the student. With that in mind, a few examples (non-exhaustive), or suggested differences that could be used to distinguish between 4000 and 5000 level students are:

- Additional project requirements for 5000 level students
- Additional exam problems for 5000 level students
- Additional reading assignments and evaluations for 5000 level students
- Additional reports, homework, or other measure of student performance for 5000 level students
- Inclusion of a teaching role for the graduate students

6.15 Grievance Procedures

The Graduate School Grievance Procedures are intended to provide a process by which graduate students can communicate concerns related to academic issues or academic conflicts. Please also view the University's brief guide on student appeals, complaints, and grievances. Should you need any assistance with these procedures, please make sure to reach out to your Graduate and/or Faculty advisor, where appropriate.

Summary of Changes

A

A.1 October 15, 2019

The version of the Graduate Handbook dated October 15, 2019 (filename MEGraduateHandbook_101519.pdf) is the baseline version of the handbook that codifies pre-existing policies and procedures in the Department of Mechanical Engineering Graduate Program and makes the following changes:

- A new process to address internal applications and changes of program (e.g., from Professional MS to PhD degree) is outlined in Section 2.5. Additionally, details are provided in this section on the process for applying to the PhD program both with and without the expectation of Department funding as a Teaching or Research Assistant.
- Of the 30 course hours required by PhD students to graduate, 9 of these hours must be from 5000-level courses from the CU Department of Mechanical Engineering (i.e., MCEN courses), as described in Section 4.4.1. Previously there was no required minimum number of MCEN course hours for the PhD degree in Mechanical Engineering.
- As outlined in Section 4.4.3, all PhD students are required to take MCEN 5020 Methods of Engineering Analysis and to pass with a grade of B- or higher. Students receiving a grade below B- in MCEN 5020 must retake the course. This course satisfies the "Mathematical Proficiency Requirement" for PhD students and there is no longer a written "test out" or "preliminary" methods exam.
- The Research Expectations Form must be completed by both PhD and MS Thesis students once a research advisor has been found, as outlined in Sections 4.4.4 and 5.4.2, respectively.
- The "Research Development Requirement" for PhD and MS Thesis students now simply requires successful completion of MCEN 5208: Introduction to Research, as described in Sections 4.4.5 and 5.4.2. This requirement replaces the previous "Professional Development Workshop" (PDW) requirement, although PDWs will still be tracked for more senior PhD students (i.e., those matriculating prior to Fall 2019) who remain under the old system.
- For PhD students, comprehensive exam reports and written dissertations must be sent to the exam committee and the ME Graduate Advisors no later than two weeks before the exam date, as outlined in Sections 4.4.7 and 4.4.9. Previously, this requirement was not rigorously enforced, but students who fail to meet this deadline may now be asked to delay their oral examination to meet the two week requirement.
- For MS Thesis students, written theses must be sent to the exam committee and the ME Graduate Advisors no later than one week before the exam date, as outlined in Section 5.4.2. Previously, this requirement was not rigorously enforced, but students who fail to meet this deadline may now be asked to delay

their oral examination to meet the one week requirement.
- The oral public presentation at the PhD comprehensive exam and dissertation defense, as well as the MS Thesis defense, should be between 45-50 mins in length, as detailed in Sections 4.4.7, 4.4.10, and 5.4.2. Previously, there was no recommendation for minimum presentation length.
- The numbers of Professional Development Program (PDP) required seminars have been updated to:
  - **PhD:** 25 PDP seminars
  - **Professional MS:** 15 PDP seminars
  - **MS Thesis:** 10 PDP seminars
  - **BAM:** 10 PDP seminars
  - **Dual Degree in Engineering Management and ME:** 15 PDP seminars

Each of these changes have been discussed and approved by the Department of Mechanical Engineering Graduate Committee during the Fall 2019 semester.

A.2 May 28, 2020
The version of the Graduate Handbook dated May 28, 2020 (filename MEGraduateHandbook_052820.pdf) includes updated oral preliminary exam concept inventories, as well as a link to prior exams, in the new Appendix on concept inventories.

A.3 August 19, 2020
The version of the Graduate Handbook dated August 19, 2020 (filename MEGraduateHandbook_081920.pdf) includes typo corrections and clarifications throughout, updates to personnel and contact info in Chapter 1, removes the GRE requirement from Chapter 2, provides further information on summer fellowships in Chapter 3.

A.4 September 22, 2021
The version of the Graduate Handbook dated September 24, 2021 (filename MEGraduateHanbook_092421.pdf) includes typo corrections and clarifications throughout as well as the following more substantial changes:

- Updates to personnel and contact info in Chapter 1.
- A description of the joint mechanical and environmental engineering degree program in Section 2.2.2.
- A new Section outlining eligibility for application fee waivers.
- A description of the English language screening test for international students serving as TAs in Section 3.5.1.
- The professional development requirement has been removed from Chapter 4 describing PhD degree requirements, and the new research development requirement is described.
- The professional development requirement in Chapter 5 describing Professional MS degree requirements has been changed to consist only of a passing grade in MCEN 5208: Industry Skills.
- The professional and research development requirement in Chapter 5 describing MS Thesis degree requirements has been changed to consist only of a passing grade in MCEN 5208: Introduction to Research.
- A description of the new internship for credit course has been added to Chapter 6.
- Students are now only allowed to count 6 credit hours total of independent study and internship for credit courses towards their degrees, as described in Chapter 6.
- Appendix C has been added with upcoming class schedules and instructors.
- Appendix D has been added with descriptions of ME graduate courses.
- Additional oral preliminary exam guidelines have been included in Appendix on Oral Prelims.

A.5 February 11, 2022
The version of the Graduate Handbook dated February 11, 2022 (filename MEGraduateHanbook_021122.pdf) includes updated graduate chair contact info in Chapter 1, new RA/TA pay rates in Chapter 3, a description of the research preliminary exams in Appendix E, a resource document for faculty in Appendix G, as well as other

typo corrections and clarifications throughout.

A.6 May, 2022

Several updates applied to make minor adjustments to Oral Prelim concept inventories, update exam leads, update exam format, and to indicate the planned phase-out of the BioM^3 exam.

A.7 September, 2022

Updates applied to requirements for when to take the oral prelims (must be attempted at the end of the first year, with retakes the second year), discussion of accommodations, timing of the research prelim (within one semester of passing orals), removal of BioM^3 exam, clarification of comprehensive and defense exam committee membership, and updates to Table 2 (timeline).

A.8 July, 2023

Updates to links to many forms that moved from Google drive to other locations, replacement of administrative and course information that is already published elsewhere on our department web site with links to relevant web pages.

A.9 September, 2024

Updates to course numbers (MCEN 5208 Intro to Research is now MCEN 5030 Intro to research, MCEN 5208 Industry Skills is now MCEN 5000 Sociotechnical Industry Skills), clarify PhD committee requirements, update staff names, update newly added graduate certificates.

A.10 October, 2025

Updates to preliminary examinations (previously, the department held fundamental topic prelims followed by research prelims and now it holds a 2-part preliminary exam that has a written scholarly foundations report and an oral exam), add new MS Thesis Milestones process, update MS scholarship info, remove external application information (since it's updated on our website), update the faculty resources page with updated links, update some forms, update staff names, update broken links.

B Forms

B.1 Internal Mechanical Engineering Forms

- Application for department support
- Graduate Part-Time Teaching Instructor (GPTI) Application form
- Graduate Committee petition
- Course Assistant Interest Form
- Independent Study Agreement form
- Internal Graduate Program Application form
- Internship for credit agreement form
- Internship for credit final evaluation form
- MCEN 5055 Advanced Product Design Intent to Enroll Form
- Research expectations form (MS Thesis)
- Research expectations form (PhD)
- Research preliminary exam form (2025-26 and previous)
- Student of the month
- Teaching assistant expectations form
- Thesis/Dissertation hours enrollment request form

B.2 Graduate School Forms

- Bachelor's Accelerated Master's (BAM) continuation form
- Bachelor's Accelerated Master's (BAM) intent form
- Candidacy application for advanced degree
- Doctoral Comprehensive Exam Form
- Doctoral Comprehensive Exam Conditional Pass Form
- Doctoral Final Exam Form
- Graduate student request for extension of time limit
- Master's Final Examination Form
- Request for Transfer of Credit form
- **Note: Complete List of Graduate School Forms**

ME Graduate Course Offerings

The current set of course offerings can be found on the ME Courses website. Schedules for past and current semesters are also available from the university Class Search page. Students can reach out to their graduate program advisor (GPA) with questions.

D

ME Graduate Course Catalog

View the Course Catalog for detailed descriptions of graduate course offerings, including prerequisites and regular instructors.

Preliminary Examination

E.1 Preliminary Exam Guidelines

The Mechanical Engineering preliminary examination (prelim exam) is a rigorous, multi-stage process designed to assess a doctoral student's preparedness for independent research. The exam challenges students to demonstrate mastery of foundational knowledge in their area, a deep understanding of scholarly literature, and the ability to design and articulate a meaningful research agenda.

This process (see Fig. 1) consists of two integrated stages: 1) a written scholarly foundations assessment and 2) an oral preliminary exam. Together, these elements are designed to evaluate the student's knowledge and research readiness as well as their capacity for critical synthesis and technical communication.

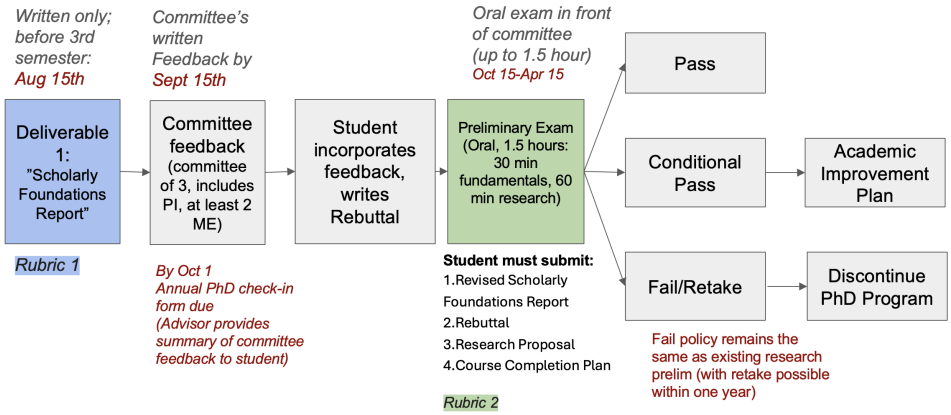


Figure 1: Preliminary exam flowchart.

E.2 Exam Purpose and Scope:

The primary goals of the prelim exam are as follows. First, it ensures that students possess a strong conceptual and theoretical grounding in the fundamental areas of Mechanical Engineering most relevant to their focus area(s) and intended research. Second, it assesses students; abilities to conduct a structured and critical engagement with, and synthesis of, scholarly literature. Third, it provides an opportunity for students to define and communicate their planned research direction, including a rationale for their contribution to the field. By completing the prelim exam, students demonstrate that they are capable of transitioning from coursework to research, and from knowledge acquisition to knowledge creation.

E.3 Examination Committee:

The committee shall consist of the student's primary advisor and two additional faculty (out of the three members, at least two must have appointments in Mechanical Engineering).

E.4 Scholarly Foundations Assessment

E.4.1 Scholarly Foundations Report

The first component of the exam is a written scholarly foundations report.

- Topic: The report must contain a rigorous, well-organized review and critique of the scholarly literature on a specific topic or set of topics. The topic(s) will be decided via discussion with the student's primary advisor in the late spring to early summer of their first year. The content may be directly related to the student's thesis research. It may also be on an adjacent or complementary topic, if the advisor feels breadth of fundamental subjects is warranted. Additionally, it is permissible that the topic ends up being disconnected from the student's ultimate research direction if the latter changes owing to e.g. research pivots, funding changes, changing groups, etc.
- Technical requirements: The scholarly foundations report is due August 15 prior to the student's second year in the program. The report must draw on a substantial body of peer-reviewed literature, with a minimum of 30 references and a maximum of 60. Students are encouraged to include both foundational/canonical works and recent contributions to demonstrate an understanding of both the historical context and the current state of the field. The writing should be clear, well-organized, and professional in tone, suitable for publication for an academic audience. This report will consist of 10 to 20 single-spaced pages (excluding references) and 5 to 9 figures, 11 pt Arial or Times New Roman font and 1 inch margins, and follow common review requirements from the student's field. Over the next few years, the Graduate Committee and individual research groups will amass sample reports from prior years for students to use as a guideline on length, scope, and format. Since this is a new form of assessment for the department, please note that the Graduate Committee will periodically review the specific details of this assessment, including instruction materials and page requirements, based on feedback from faculty, staff, and students.
- Content and scope: The scholarly foundations report is not just a summary of existing work. Rather, it must show evidence of deep synthesis, thematic analysis, and scholarly critique. The student is expected to identify the major conceptual, methodological, and empirical trends in the literature, trace their development, and highlight key debates or points of contention. Crucially, the student must also identify and articulate specific gaps in the existing body of knowledge - areas that are underexplored, inconsistently addressed, or contested. These gaps may form the basis for the student's proposed research contribution, though specific details of a research plan should not be included in this report.

The following must be addressed in the report:

- Overview of key concepts, methods, and debates in the research area
- Synthesis and comparison of approaches
- Identification of gaps, limitations, and opportunities for future work

In addition to the report, the student must also submit their course completion plan. This plan outlines the

coursework completed and planned and should demonstrate alignment between the student's research area and course selections.

E.4.2 Scholarly Foundation Report feedback and Annual Evaluation

The exam committee members will independently review and evaluate the submission by September 15. Using a structured rubric, the committee will assess the student's understanding of technical concepts and theories, the quality of their analysis and critique, the clarity of their written communication, and the coherence and sufficiency of their proposed coursework. Each committee member provides written feedback, which is compiled by the primary advisor and shared with the student at the Annual Doctoral Progress Meeting no later than October 1.

E.4.3 Rebuttal

Students must write a rebuttal that addresses the feedback provided by their committee on the initial scholarly foundations submission. This rebuttal should be completed in a professional and constructive tone and be similar to that required following a manuscript revision. The student should clearly indicate how specific revisions were made in the revised document or provide a well-reasoned explanation if a particular suggestion was not incorporated. The rebuttal should pair each piece of committee feedback with the student's response and the corresponding change in the text using line numbers and tracked changes. The purpose of the rebuttal is to demonstrate the ability to reflect on scholarly critique and improve the quality of one's work based on expert guidance, and to hone skills related to the peer-review publishing process.

E.4.4 Revised Scholarly Foundations manuscript

Students must revise their scholarly foundations report in response to committee feedback. This is akin to the standard process of revising a manuscript in response to peer review.

E.5 Oral Preliminary Examination

E.5.1 Planning for the Oral Preliminary Examination

Students must complete the oral preliminary exam between October 15 and April 15 of their second year. The following documents must be shared with the Examination Committee at least one week prior to the oral exam:

- Revised Scholarly Foundations Report
- Rebuttal
- Research Proposal
- Course Completion Plan

E.5.2 Research Proposal

The research proposal is a concise, five-page document that builds upon the scholarly foundations assessment by outlining the student's intended dissertation research in greater depth and specificity. While the foundations assessment situates the research within the broader scholarly landscape, the research proposal shifts focus toward defining the student's original contribution. It should articulate a clear and compelling research problem, explain its significance within the field, and describe the conceptual framework and methods that will guide the investigation. The proposal must also include any preliminary results, pilot studies, or formative work the student has completed to date, demonstrating early progress and feasibility.

E.5.3 Course Completion Plan

Per the requirements in the Annual Progress Report, students will upload their transcript and identify remaining coursework planned (including course number and title, as well as proposed semester of enrollment).

E.5.4 Conducting the Oral Preliminary Examination

Students must prepare a 45 minute presentation containing two sections:

- Scholarly Foundations (15 minutes)
- Research Proposal (30 minutes)

For the first section, students shall first introduce their overarching topic area and prepare material based on the rebuttal of their scholarly foundations report. They should synthesize feedback from their report reviews and demonstrate how these were addressed in their revised report. They should not prepare a powerpoint of their entire report contents.

For the second section, students shall prepare a summary of their research proposal, including progress to date and future plans.

The overall oral exam length is 90 minutes. This time allows for roughly 45 minutes of committee questioning as well as discussion amongst the committee on the exam evaluation as needed.

E.6 Preliminary Exam Outcomes

Based on considerations of the rubric outlined in Section 2.8.2, the outcome of the preliminary exam will be one of:

- Pass. A Pass will typically be an average score of 4.5 or above.
- Conditional Pass, with Academic Recovering Plan (ARP). A Conditional Pass will typically be an average score of 3-4.5, or 1-2 in any single category. Conditions for a Conditional Pass will be determined by the exam committee and formulated as an ARP. The ARP may include things such as giving a guest lecture, writing a report, an updated research plan, recommendations on future coursework, grade requirements on specific future coursework, or direct a student's TA appointment to be in a particular area. The student will be required to schedule a meeting with the Graduate Committee Chair to review their ARP. Students will typically have a year or less to complete their condition; failure to satisfy the condition(s) may result in removal from the PhD program.
- Fail, with possibility for retakes. A Fail will typically be an average score less than 3. A failing grade does not necessarily mean the student is out of the PhD degree program, and the student is often encouraged to retake the exam and submit an Academic Recovering Plan (ARP). Students must retake the exam and pass within 1 year of the first exam; failure to pass this exam may result in removal from the PhD program.

E.7 Assessment of the Preliminary Examination Process

Each year the Graduate Committee will conduct an assessment of feedback on the preliminary exam process from students who have recently completed it. There will also be periodic gathering of input and feedback from the department. The Graduate Committee will also continue to receive feedback from students further along in the program through forums such as ME Town Halls and the Committee for Equity in Mechanical Engineering (CEME).

E.8 Rubrics

The following rubrics are designed to provide faculty with scoring students from 1-5.

Table 3: Rubric 1: Scholarly Foundations Report

Criteria	Emerging (1)	Developing (3)	Mastery (5)
Underlying technical subjects	Demonstrates limited understanding of relevant technical subjects; frequent inaccuracies or omissions.	Demonstrates basic understanding of technical subjects; some gaps or oversights are present.	Demonstrates strong grasp of relevant technical subjects; integrates concepts accurately and effectively.
Underlying foundational theories and principles	Shows poor understanding of foundational theories; unable to apply them to research or problem context.	Understands key theories and principles; applies them in a general or partially relevant way.	Demonstrates deep understanding and application of foundational theories directly related to the research context.
Quality of synthesis and critique	Mostly descriptive; summarizes sources individually without connecting them. Shows limited critical engagement.	Demonstrates some synthesis and comparison across sources. Begins to identify patterns, contradictions, or gaps, but analysis may be unconventional or surface-level.	Offers a coherent, insightful synthesis of literature. Critically evaluates and integrates sources, identifies key themes and debates, and clearly articulates the research gap or rationale.
Quality of written communication	Writing is unclear or disorganized; grammar or syntax errors interfere with readability. Use of academic style or citation is inconsistent or incorrect.	Writing is generally clear and organized, with some minor issues in flow, grammar, or tone. Academic style and citation format are mostly correct but may have small inconsistencies.	Writing is polished, well-organized, and professional. Language is precise, scholarly, and error-free. Citations are complete and correctly formatted throughout.
Course completion and plan	Courses are not aligned to fundamental area, multiple additional courses are required.	Some courses are aligned, one additional course is required.	Courses are well-aligned with fundamental knowledge area, clearly relate to research area.

Table 4: Rubric 2: Oral Preliminary Exam (1/2)

Criteria	**Emerging (1)**	**Developing (3)**	**Mastery (5)**
Literature and Previous work	Demonstrates limited understanding of prior work; sources are poorly integrated or lack relevance.	Shows basic understanding and coverage of relevant work; some synthesis present.	Demonstrates deep knowledge and synthesis of prior work; literature is relevant, well-integrated, and clearly informs the research plan.
Quality of rebuttal	Responses to feedback are minimal or defensive; fails to address substantive concerns.	Acknowledges feedback and responds to some concerns with reasonable justification or clarification.	Engages thoughtfully and constructively with critique; provides clear, well-reasoned rebuttals or adjustments to strengthen their review.
Problem definition	Problem is vague, overly broad, or lacks significance; poorly linked to the literature.	Problem is clear and relevant, though may lack depth or precise scope.	Problem is clearly defined, specific, and significant; well-motivated by the literature and broader context.
Research plan	Research goals or methods are unclear, underdeveloped, or unrealistic.	Research plan is generally sound with some gaps in feasibility, clarity, or alignment with the problem.	Research design is detailed, feasible, and well-aligned with the research objective; methodology is appropriate and clearly justified.
Preliminary and expected results	Lacks meaningful preliminary work or speculative results with little grounding.	Provides some initial results or logical expectations; limited connection to research plan.	Presents solid preliminary results or well-grounded anticipated outcomes; clearly supports research direction.

Table 5: Rubric 2: Oral Preliminary Exam (2/2)

Criteria	**Emerging (1)**	**Developing (3)**	**Mastery (5)**
Impact of proposed research	Broader significance is unclear or unconvincing.	Some discussion of broader impact or contribution, though it may be general.	Clearly articulates the contribution to the field and broader implications; connects research to societal, technical, or academic impact.
Quality of Written and Oral Communication	Presentation and/or document are disorganized, unclear, or contain major writing issues.	Communication is mostly clear and structured with minor issues in clarity or style.	Clear, professional, and well-organized communication; appropriate tone, format, and language throughout.
Critical Thinking	Demonstrates limited ability to evaluate assumptions, methods, or implications.	Some critical thinking is evident, though analysis may be superficial or inconsistent.	Shows strong analytical thinking, questioning of assumptions, and reflection on implications and limitations.
Response to questions	Poorly interprets examiner questions; uneasiness or inability to answer questions or provides inaccurate answers.	Reasonable interpretation of questions; able to answer questions with some coaching.	Accurate interpretation of questions or seeks necessary clarification; answers questions with authority and accuracy.
Course completion and plan	Courses are not aligned to fundamental area, multiple additional courses are required.	Some courses are aligned, one additional course is required.	Courses are well-aligned with fundamental knowledge area, clearly relate to research area.

F Resources for Teaching Assistants

F.1 Center for Teaching and Learning

The Center for Teaching and Learning (previously known as the Graduate Teaching Program) is a graduate and professional student development program that strives to encourage graduate students to embrace teaching as an intellectual and inclusive act and to pursue their personal and professional development through participation in the program. The Center for Teaching and Learning (CTL) provides workshops that focus on pedagogical techniques and professional development. In addition to workshops offered throughout the year, the CTL holds two training events each year, the Fall Intensive and Spring Conference. These training events are open to all graduate students.

To encourage graduate students to focus on gaining teaching skills, the CTL also offers two certificates and in college teaching and future faculty development. The two certificates include, the Certificate in College Teaching (CCT) and the Future Faculty Development Certificate (FFD). The CCT helps graduate teachers develop a confident classroom presence, good interactional skills, and a firm foundation in college teaching. Graduate students must teach for two semesters to pursue this certificate.The FFD offers graduate students the opportunity to pursue a project on teaching at the college level under the guidance of a faculty mentor. Graduate students are not required to teach to pursue this certificate. While the Pursuing Excellence in College Teaching Credential (CTC) allows graduate students whose programs do not offer opportunities for classroom teaching, or for those who are not able to complete the Certificate in College Teaching (CCT). Links to the requirements for each certificate/credential are listed below.

- Certificate in College Teaching (CCT)
- Future Faculty Development Certificate (FFD)
- College Teaching Credential (CTC)

F.2 Lead TA

The Lead TA of the Mechanical Engineering department works closely with both the department and the CTL to advance teaching and professional development in the department. Through this position, the Lead Graduate Student will receive training in academic management, academic leadership, college pedagogy, collegial teamwork and project management.

Responsibilities of the Lead Graduate Student are listed below:

- Develop and implement an original project that contributes to the improvement of teaching and/or professional development in the Mechanical Engineering Department

- Organize orientation for the incoming 1st year PhD students
- Participate and help to organize the College of Engineering and Applied Science orientation
- Meet with 1st year PhD students individually during the Fall and Spring semester for check-in meetings
- Serve as a consultant on teaching and college pedagogy
- Act as a liaison between the PhD students and the ME department faculty and leadership
- Act as a liaison between the CTL and the ME department, communicating information about CTL activities and programs to graduate students
- Conduct three non-evaluative videotape consultations
- Conduct consultative microteaching sessions with graduate students
- Conduct one professional development/teaching workshop
- Submit required documentation (e.g., Lead Plan, Lead network evaluations, Capstone project) to the CTL

All leads are required to attend the following events:

- May Lead Training (usually 3 days about a week after finals in May)
- Best Should Teach Lecture in August
- Fall and Spring small group meetings
- Fall Lead Network meeting
- Collaborative Preparing Future Faculty Network (COPFFN)/Spring Conference event in January
- Lead Capstone Event

F.3 Grading

The method of grading for homework, quizzes and exams will be determined by the course instructor. Some faculty have a preferred methods for each type of assignment or assessment. However, we encourage TAs to suggest different methods to grade more efficiently (so that the TA can focus on other teaching responsibilities). Examples of ways to grade more efficiently are listed below.

- Make sure that all assignments created have clear goals and instructions. This way, students will have more consistent answers that will be easier to grade.
- Use different grading scales for different assignments.
  - check +, check, check- (for quizzes, homework, response papers, quick reports or presentations, etc.)
  - 100-point numerical scale (for exams, certain types of projects, etc.)
  - pass-fail or credit-no-credit (for preparatory work)
- Grade one problem at random from each homework assignment
- Post quizzes on Canvas, so they can be graded automatically
- Limit your comments or notations to those your students can use for further learning or improvement
- Spend more time on guiding students in the process of doing work than on grading it

For more information on grading, *click here* for a great resource.

F.4 Faculty Expectations

When graduate students were asked for advice about TAing, 47% of students mentioned communication as key advice for TAing. Part of improving communications is establishing clear expectations from the instructor teaching the course. Faculty expectations of each TA should be determined before the semester begins. We recommend that all TAs meet with the faculty member instructing the course they are assigned to and use the TA expectations document to go through the expectations for each class. This document is provided to all TAs at the time they receive their TA assignment each semester. If you no longer have access to this document, please reach out to a graduate advisor.

F.5 Best Practices

General Reminders

- When paid to be a TA by the department, TAing is your main priority. For example, if a TA responsibility conflicts with lab meeting time it would be important to try to reschedule lab meeting to a time that would not conflict. If this is not possible, working with the instructor and your PI to suggest a compromise (e.g. attend lab meeting every other time) would be another option.
- Be professional with your professor and your students. Communicate openly with your professor, especially regarding semester and summer breaks.
- Set boundaries for yourself. For example, it is important to respond to students' questions quickly, but you may want to communicate to your students that you will not respond to email after 11:00pm.
- You must introduce yourself to your TA class during the first week of school and send an email to the class (cc'ing your Lead TA). These introductions are extremely important because previously a lot of undergraduates did not know who their TA was.

Scheduling Office Hours

Office hours in the Engineering Center

- Note: Using the ME conference rooms is not allowed (If the professor would like the office hours held here they must book it themselves)
- To request a classroom in the Engineering Center for AFTER 5:00PM ONLY, contact the ME front desk (mefrontdesk@colorado.edu). When contacting the front desk, please include the following information:
  - Course number and title
  - Day(s) of the week for office hours or Date(s) for review sessions.
  - Start and end time. It's also helpful for the Front Desk to know whether their preferred start and end time are flexible (i.e.: prefer 6-7PM, but could also do 7-8PM).
  - Anticipated attendance. Classrooms tend to fall into 25+, 45+, 60+, 80+, and 120+ seat ranges. So those are good options to keep in mind.

Office Hours in the Idea Forge

- *For more information click here* or contact: victoria.lanaghan@colorado.edu
- Note: There are many events that occur in the Idea Forge throughout the year and office hours could move around when these events occur during your scheduled time.
- Idea Forge Commons
  - Capacity: 60 +
  - Tables for students to collaborate
  - White boards
  - Can be noisy sometimes because other students can work there
- Drop-In Design Lab
  - Capacity: 48 +
  - Tables for students to collaborate
  - Small conference rooms on the side with TVs for presentations
  - Whiteboards
  - Can be noisy sometimes because other students work there
- Classroom 271B
  - Capacity: 15
  - Tables for students to collaborate
  - Whiteboards
  - Quiet

Assignment Filing

Assignments are returned to students based on the preference of the course instructor. Most instructors will

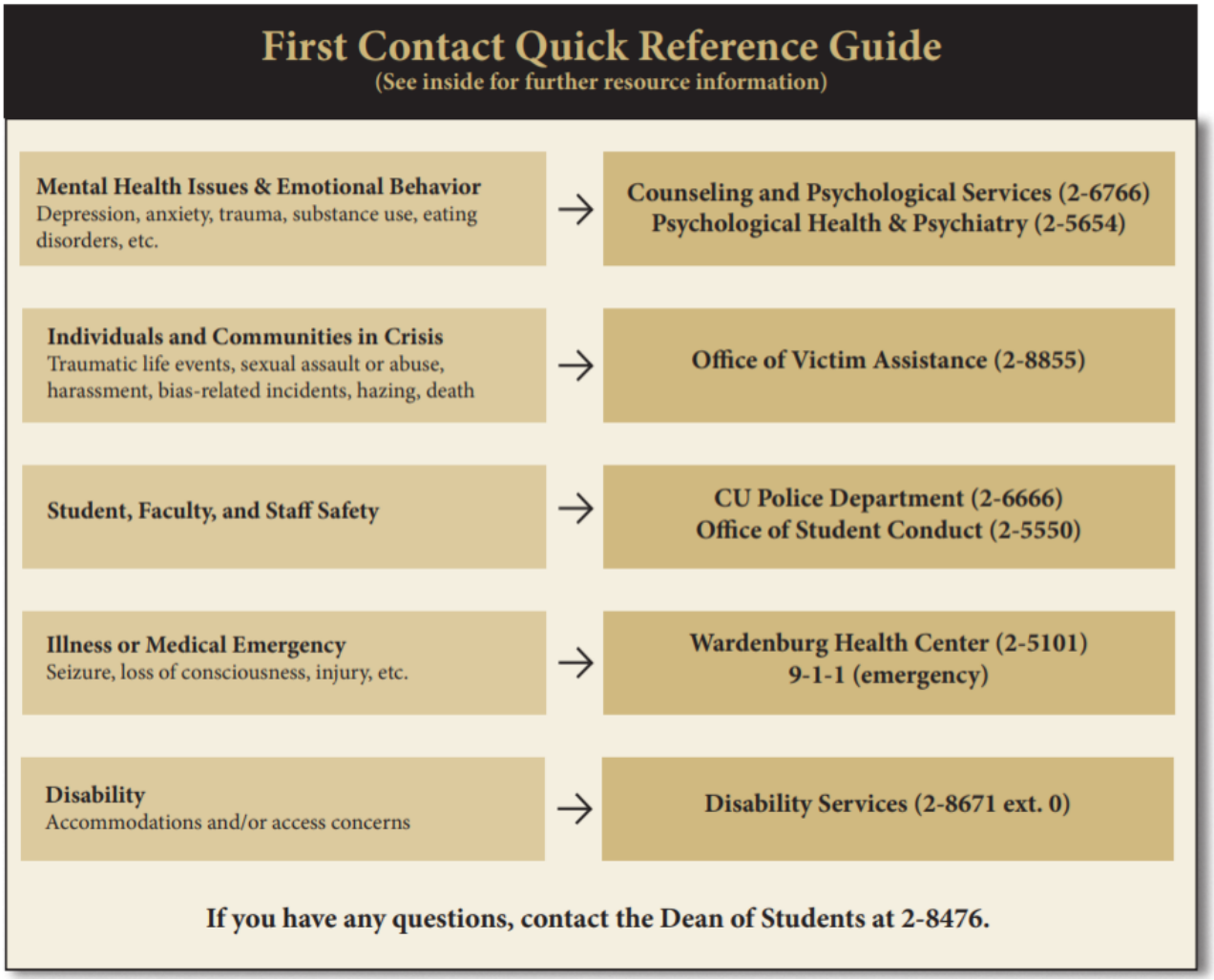
prefer that assignments are returned to students in their student folder in the filing cabinet by the front desk. It is important to organize all assignments by ME ID to make filing more efficient. When filing, the TA may ask the front desk staff if they would be able to help file the assignments only if the front desk staff is not busy or does not have other priorities from the department at the time. The TA must stay in the front desk to assist in filing the whole time.

Students in Distress

If you notice that a student in your class is in distress, take action according to the situation. This Graduate School resource can help guide how to deal with certain situations.

Remember as an employee of CU Boulder, you are a mandatory reporter. CU-Boulder policy requires any supervisor who becomes aware of a complaint of protected class discrimination and harassment and sexual harassment (including sexual assault, intimate partner abuse, and stalking) or related retaliation, to promptly report it to the *Office of Institutional Equity and Compliance (OIEC)* if the alleged perpetrator is an employee or a student.

For more information on how to respond to a disclosure, view the following Mandatory Reporting Policy.



Pedagogical Resources

- *Click here for website including teaching and mentoring resources*
- *Click here for a guide specifically for TAing*

G Resources for Faculty

The graduate handbook provides an exhaustive and detailed description of graduate program requirements and processes. However, faculty frequently request further clarification on a number of topics, and explanations of these topics are provided below.

G.1 Student Advising

- **Student Expectations:** Faculty are encouraged to review and complete the following documents with their TAs, RAs, and/or CAs:
  - Research Assistant (RA) expectations
  - Teaching Assistant (TA) expectations
  - Course Assistant (CA) expectations
- **Dissertation Hours:** PhD students are required to have 30 dissertation hours in order to graduate. Any hours beyond 30 are unnecessary and can incur additional unnecessary expenses on sponsored projects. Faculty should work with their students and the graduate advisors to ensure that PhD students complete as close to 30 dissertation hours as possible by the end of the semester in which the PhD defense takes place. The following restrictions on dissertation hours must, however, be observed:
  - PhD students must be registered for at least 1 dissertation hour during the semester in which they complete their comprehensive exam;
  - PhD students must be registered for a minimum of 5 dissertation hours in each of the fall and spring semesters after completing their comprehensive exam and defense;
  - PhD students must be registered for 5 dissertation hours during the semester in which they complete their dissertation defense;
  - PhD students may register for a maximum of 10 dissertation credits in any given semester.

  To aid with dissertation hour tracking, only the graduate advisors can enroll PhD students in dissertation hours; please encourage your students to submit the dissertation hours enrollment request form if they need to be registered for dissertation credits.
- **Student Support Resources:** Below are resources that faculty may refer to when supporting students.
  - Students with concerns such as academics, anxiety, body image, depression, relationships, substance use and more, should contact Counseling & Psychiatric Services (CAPS), which is a confidential, on-campus mental health and psychiatric service.
  - The Office of Victim Assistance (OVA) provides free and confidential information, consultation, support, advocacy, and short term counseling services to CU students, graduate students, faculty, and

staff who have experienced a traumatic, disturbing or life disruptive event.
  - Faculty may refer students to Student Outreach, Advocacy, and Support (SOAS) if they have been hospitalized, have experienced the loss of a loved one, have a family emergency, are experiencing food and/or housing insecurity, or have exhibited threatening behavior.

View additional campus resources and more general health resources.

G.2 Funding

- **Tuition:** Detailed information on tuition and fees is available on the Bursar's Office, under the Tuition and Fee Rate Sheets section. After choosing the appropriate semester on this page, PhD and MS Thesis student tuition rates are listed under the "Graduate" heading, while MS Professional tuition rates are listed under the "Professional Graduate" heading.
- **Pay Rates:** Monthly stipend compensation rates for student assistantships, as of 2025-26, are:
  - *Pre-comprehensive exam:* $3,353 per month
  - *Post-comprehensive exam:* $3,605 per month

  MS Thesis students on appointment are paid at the pre-comprehensive exam rate.
- **Applications for Departmental Support:** Three times per year (corresponding to the fall and spring semesters, as well as the summer), faculty advisors of mechanical engineering PhD students are given the opportunity to request departmental support (in the form of department-supported TA or RA positions, or fellowships during the summer). Announcements of the application review deadlines are made via email to the me-facstaff mailing list, and faculty can apply for funding using this form. This application form is not required for startup TA or RA requests, which can be made directly to the department financial team. Support provided through this application process is only provided for one semester at a time and separate applications must be submitted to request support in future semesters.

  Selection of students for financial support is based on need, prior departmental support received by the student, merit, and the availability of funds. Preference is given to currently enrolled PhD students, although an application may be submitted and will be reviewed for MS Thesis students. Students are selected by the graduate or executive committees, with input from the department financial team to assess need. During the fall and summer semesters, these positions provide selected students with a 50% appointment, including tuition remission and health benefits, at standard pay rates based on status (i.e., pre- or post-comps). Fellowships awarded for the summer do not include a tuition waiver/tuition remission. Faculty are expected to use any startup TA/RA positions available to them prior to requesting department support.
- **Professional MS Funding Restrictions:** According to Graduate School rules, students in our professional MS degree program cannot be placed on RA or TA appointments. These students can, however, be hired as hourly-paid course assistants or research assistants. Graduate students in the MS Thesis program can be funded as RAs or TAs, with tuition remission and benefits.
- **Hourly research assistants:** Requests for hourly research assistants (i.e., hourly employees who are not part of the course support process) should be made directly to Brandy Leggins-Baker.

G.3 Recruiting and Admissions

- **Internal Applicants:** Current CU students seeking to switch programs (e.g., from MS thesis to PhD) should complete the Internal Graduate Application Form. Off-cycle (e.g., spring or summer) internal PhD applications will be reviewed if the student's research advisor is prepared to fully fund the student's PhD program. That is, no promise of department support is made for PhD students admitted off-cycle. Current CU students wishing to transfer into the PhD program with department support (TA in first year) should complete the Internal Graduate Application Form by Dec. 15 so that their application can be reviewed alongside other external applicants applying to start the PhD program the following fall semester.
- **MS Thesis Incentive Program:** Effective Spring 2025, the Department of Mechanical Engineering will provide $800 of discretionary funds to faculty for each 1 credit hour of MCEN 6959/6949 their MS Thesis

student is enrolled in (Master's Thesis/Master's Candidate for Degree). The incentive payments will only be awarded when the following conditions are met:

1. The incentive request form is submitted by the requested deadline (an email will be sent to the me-facstaff listserv every semester with additional instructions).
2. The student is enrolled in at least one credit of MCEN 6959/6949 in the identical semester as the incentive request. Summer terms are included in this condition. Exception: If the student is defending in a "grey area" and is not required to enroll in credits by advisement of the Graduate Program, they will be exempt from this condition.
3. The student has enrolled in 9 cumulative credits or fewer of MCEN 6959/6949.

To facilitate the distribution and tracking of these funds, students will be required to complete the Milestone Progress Report at each milestone. This report will outline the student's plan of study (POS), including expected graduation timeline, to allow both the advisor and the program to track progress and determine the disbursement schedule. Milestone 2 is where a student will submit a Plan of Study (POS) which will designate which semesters the student will be enrolled in MCEN 6959/6949 and therefore, what semesters the thesis advisor will be receiving the incentive payments. The faculty advisor will still have to request the incentive payments at the beginning of each semester and by the stated deadlines. The POS is not a thesis incentive request but rather documentation of anticipated incentive payments.

For Declared MS Thesis Students Prior to Fall 2024: If your MS Thesis student was declared as a thesis student before Fall 2024, the previous policies and incentive amount of $2,500 per semester will be applied for Spring 2025. Please refer to the appropriate section of the incentive request form for these details and criteria.

G.4 Course Support

- **Procedure:** Course support is allocated by the graduate chair, undergraduate chair, and graduate administrators 1-2 months before the start of each semester. The initial step in determining these allocations is for faculty to submit the Course Support Preferences Survey. Faculty will be provided with TAs' CVs and placement preferences to assist with their request. Responses to this form are typically requested in July for the fall semester, in November for the spring semester, and in May for the summer semester. After initial allocations are determined, they are then sent to instructors for review. Once this review has been completed, the students are then notified of their TA assignments and connected with instructors. At this point, if instructors are allocated hourly-paid Course Assistant (CA) hours, they can submit this CA employment form.
- **Calculation of Course Support:** An initial estimate of the number of support hours to assign each course is calculated as $N/4$ (minimum $N = 16$) for lecture courses and $N/3$ (minimum $N = 12$) for courses with labs/recitations, where N is the number of students enrolled in the course. Both TAs and CAs are used to fill the hours for courses, based in part on responses to the instructor course support preferences survey. Typically, a TA is assigned a 20 hour appointment while CAs are hired at variable hours based on instructor CA allocations and needs. Faculty can check their course enrollments (i.e., N) via my.cu.edu.

G.5 Curriculum

- **4000/5000 Level Courses:** The CU Graduate School requires that there be a difference between 4000 and 5000 level courses that are taught as a combined 4000/5000 section. Students registered at the 5000 level are taking the course for graduate level credit, and thus the course expectations of that student must be at the graduate level. Conversely, students registered at the 4000 level are taking the course for undergraduate level credit, and thus the course expectations must be at the undergraduate level.

  It is advised that the course instructor keep track of the course requirement differences between the 4000 and 5000 level students. An ideal location to document this difference is in the course syllabus. In recent years there have been instances where a student requests changing course credit from 4000 to 5000 level, or vice-versa. The University allows for this change if the student's grade can be adjusted (or additional

requirements met) per documentation provided by the course instructor. One example is where a BS/MS student enrolls in a course at the 4000 level, and after completion requests a change to 5000 level, due to some unforeseen event. In this example, the course instructor is approached to determine a grade change, or asked if additional coursework needs to be completed. While it is up to the course instructor on how to proceed, having a documented difference that can be referenced can save the course instructor significant time and hassle, in addition to maintaining Graduate School requirements.

Course instructors should adjust their course requirements as to best fit their course. A graduate level course generally encourages deeper thought, additional workload, and/or higher expectations of the student. With that in mind, a few examples (non-exhaustive), or suggested differences that could be used to distinguish between 4000 and 5000 level students are:

- Additional project requirements for 5000 level students
- Additional exam problems for 5000 level students
- Additional reading assignments and evaluations for 5000 level students
- Additional reports, homework, or other measure of student performance for 5000 level students
- Inclusion of a teaching role for the graduate students

- **Independent Study:** Full details of the ME Independent Study course can be found in Chapter 6.5 of the graduate handbook.
- **Internship for Credit:** Full details of the ME Internship for Credit course can be found in Chapter 6.6 of the graduate handbook.