A. JAMES CLARK
SCHOOL OF ENGINEERING

Department of Mechanical Engineering
Graduate Handbook

2025-2026

The Mechanical Engineering Graduate Office endeavors to provide policy and procedural information as well as the personal guidance needed by students to successfully complete graduate degree programs in the Department of Mechanical Engineering.

This handbook provides information about our graduate degree programs as well as the relevant policies and procedures of the College of Engineering and University of Maryland. This handbook's purpose is to familiarize graduate students with degree program requirements, policies, procedures, and the resources available to students through the Mechanical Engineering Graduate Office. This handbook is not intended to be an exhaustive set of rules. The policies and procedures of the University of Maryland Graduate School and the University of Maryland Registrar's Office, as well as those issued by the central administration of the University of Maryland, supersede the information contained in this document.

University and Graduate School forms that students may be directed to, may also contain additional information or requirements that supersede the information in this document. It is the responsibility of each student to know and understand the information in this handbook and the University of Maryland general catalog.

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1. Graduate Programs

1.1. **Research Degree Programs.** The Department of Mechanical Engineering is home to graduate programs in Mechanical Engineering and Reliability Engineering, respectively. Each program offers degrees at the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) levels that are oriented around independent scholarship in areas relevant to the corresponding program. This handbook describes these programs.

1.2. **Professional Degree Programs.** The Maryland Applied Graduate Engineering (MAGE) Program offers Master of Engineering (M.Eng.) degrees and graduate certificates in both Mechanical Engineering and Reliability Engineering. These are mentioned in this handbook only regarding the rules for transferring between programs. For detailed program information, students should consult the MAGE web page at *https://mage.umd.edu*.

2. Scholarship Definition

2.1. **Definition.** In this handbook, *scholarship* is defined as a process of investigation, grounded in the rules of scientific inquiry, that seeks to uncover truths that are independent of the scholar conducting the investigation.

2.2. **Elements.** Scholarship includes the following elements:

- The definition of a problem/question of study and its relationship to past scholarship;
- The development of a rigorous methodology to investigate the problem/question of study;
- The systematic application of the methodology to the problem/question of study;
- The derivation of generalizable results about the problem/question of study;
- The anticipation of further scholarship, justified in terms of the shortcomings of derived results or opportunities that have become evident from the performed study.

2.3. **Scholarly Paper.** A scholarly paper is one that presents the totality of a study, ranging across all the elements outlined above. Scholarly papers are written in a format that could allow for publication.

2.4. **Standards:** Rigor and systematicity may be defined differently in the theoretical, experimental, and computational sciences, but in all cases, standards have been adopted by the engineering science community that guide the scholar. The process of *peer review* of scholarly papers is one intended to ensure that these standards are applied in a way that permits *reproducibility* and *generalizability*.

3. Coursework vs. Research

3.1. **Definitions.** Students enrolled in the M.S. and Ph.D. programs in the Department of Mechanical Engineering build competence in the exercise of independent scholarship through a combination of:

- *Coursework*, which develops and solidifies their knowledge of well-known facts and methodologies, and
- *Research*, which allows them to explore what is unknown and to make original contributions to what is known.

3.2. **Eligible credits.** In this handbook, the term "*coursework credits"* describes credits earned from courses taken at UMD (or transferred from other institutions subject to transfer credit limitations) that are used in the calculation of a student's GPA and that exclude "*research/thesis credits*", i.e., those earned from enrollment in ENME or ENRE 798, 799, 898, or 899 courses.

4. Degree Offerings (and Their Requirements)

Master's Degree Options Summary

Paragraph(s)	Degree	Requirements for the Degree	Eligibility Restrictions

4.1, 4.4	M.S. With Thesis (ENME and ENRE)	24 hours of coursework credit + 6 hours of research credit (799) + thesis	None
4.2	M.S. Without Thesis (ENME)	30 hours of coursework credit + scholarly paper	Current M.S. with thesis or Ph.D. students that are not continuing in the program. This is NOT offered as an entry point into the ENME graduate program*
4.5	M.S. Without Thesis (ENRE)	30 hours of coursework credit + scholarly paper	None
4.3, 4.6	M.S. Along the Way (ENRE and ENME)	30 hours of coursework credit + Ph.D. candidacy	Ph.D. students only
4.7	Joint B.S./M.S. With Thesis (ENME and ENRE)	24 hours of coursework credit + 6 hours of research credit (799) + thesis	Current B.S. students in Mechanical Engineering at the University of Maryland
https://mage.umd.edu	M.Eng. (ENRE and ENME)	30 hours of coursework credit	MAGE students only (must be admitted into the MAGE program)

*Students applying to the Mechanical Engineering graduate program seeking an M.S. without thesis will be directed to the MAGE program for admission consideration.

Doctoral Degree Options Summary

Paragraph(s)	Degree	Requirements for the Degree	Eligibility Restrictions
4.8, 4.9	Ph.D. (ENME and ENRE)	36 hours of coursework credit + 12 hours of research credit (899) + dissertation**	None

**Specific coursework requirements vary between ENME and ENRE, see details below.

4.1. **M.S. in Mechanical Engineering – thesis option.**

4.1.1. **Credit Requirements.** Completion of a minimum of 24 coursework credits and 6 M.S. research/thesis credits (ENME 799).

4.1.1.1. At least 15 coursework credits must be from courses at the 600-level or above.

4.1.1.2. At least 3 coursework credits must be from an approved list of core courses (see Appendix D.

4.1.1.3. At least 3 coursework credits must be from an approved list of mathematics courses (see Appendix E).

4.1.2. **Thesis.** Completion of a thesis prepared according to the guidelines in the current edition of the University's Thesis and Dissertation Style Guide. The thesis cannot be part of the student's dissertation if they are a Ph.D. student.

4.1.3. **ENME 799 Registration.** Prior to registering for research/thesis credits, permission must be obtained from the Graduate Office.

4.2. **MS in Mechanical Engineering – non-thesis option.** Only available with permission to current M.S. or Ph.D. students who are not continuing in the program.

4.2.1. **Credit Requirements.** Completion of a minimum of 30 coursework credits.

4.2.1.1. At least 18 coursework credits must be from courses at the 600-level or above.

4.2.1.2. At least 3 coursework credits must be from an approved list of core courses (see Appendix D).

4.2.1.3. At least 3 coursework credits must be from an approved list of mathematics courses (see Appendix E).

4.2.2. **Scholarly Paper**. Completion of a scholarly paper. A typical path to complete the scholarly paper is during ENME courses that require a culminating project or during an ENME 808 Independent Study.

4.3. **M.S. in Mechanical Engineering – along the way.** Only available to Ph.D. students without an M.S. in Mechanical Engineering who have been admitted to candidacy.

4.3.1. **Credit Requirements.** Students must have completed a minimum of 30 coursework credits with at least 24 coursework credits from the University of Maryland and at least 21 coursework credits at the 600-level or above.

4.3.2. **Scholarly paper.** The approved dissertation proposal fulfills the requirements for the scholarly paper.

4.3.3. Coursework that is more than five years old must be successfully revalidated.

4.4. **M.S. in Reliability Engineering – thesis option.**

4.4.1. **Credit Requirements.** Students enrolled in the M.S. Program in Reliability Engineering (thesis option) must complete a minimum of 24 coursework credits and 6 MS research/thesis credits (ENRE 799).

4.4.1.1. At least 18 coursework credits must be courses at the 600-level or above.

4.4.1.2. At least 12 coursework credits must be ENRE courses.

4.4.1.3. The *core courses* ENRE 600 Fundamentals of Failure Mechanisms and ENRE 602[1] Principles of Reliability of Analysis must be completed with at least a 3.5 GPA.

4.4.2. **Thesis.** Completion of an M.S. Thesis prepared according to the guidelines in the current edition of the University's Thesis and Dissertation Style Guide. The thesis cannot be part of the student's dissertation if they are a Ph.D. student.

4.4.3. **ENRE 799 Registration.** Prior to registering for research/thesis credit, permission must be obtained from the Graduate Office.

4.5. **M.S. in Reliability Engineering – non-thesis option.** Available for direct admission or with permission to current M.S. students, Ph.D. students who are not continuing in the program.

4.5.1. **Credit Requirements.** Students enrolled in the M.S. Program in Reliability Engineering (non-thesis option) must complete a minimum of 30 coursework credits.

4.5.1.1. At least 18 coursework credits must be courses at the 600-level or above.

4.5.1.2. At least 12 coursework credits must be ENRE courses.

4.5.1.3. The *core courses* ENRE 600 Fundamentals of Failure Mechanisms and ENRE 602[1] Principles of Reliability of Analysis must be completed with at least a 3.5 GPA.

4.5.2. **Scholarly Paper**. Completion of a scholarly paper. A typical path to complete the scholarly paper is during ENRE courses that require a culminating project or during an ENRE 648 Independent study.

4.6. **M.S. in Reliability Engineering – along the way.** Available for Ph.D. students who do not hold an M.S. and who have reached candidacy.

4.6.1. **Credit Requirements.** Students must have completed a minimum of 30 coursework credits, including the core courses ENRE 600 and ENRE 602 and two additional ENRE courses, with at least 24 coursework credits from the University of Maryland and at least 18 coursework credits at the 600-level or above.

4.6.2. **Scholarly paper.** The approved dissertation proposal fulfills the requirements for the scholarly paper.

4.6.3. Coursework that is more than 5 years old must be successfully revalidated.

4.7. **Joint B.S./M.S. in Mechanical Engineering.** The combined Bachelor's/Master's Degree (B.S./M.S.) Program is available to current University of Maryland Mechanical Engineering undergraduate students.

4.7.1. **Available Masters of Science Degrees.** B.S./M.S. students may get an M.S. in Mechanical Engineering, Reliability Engineering, or Fire Protection Engineering (see https://fpe.umd.edu/).

4.7.2. **Acceptance.** The minimum requirements for acceptance into the Combined

B.S./M.S. program are:

- At least a 3.50 GPA.

[1] Knowledge from ENRE 602 is a prerequisite for nearly every ENRE course. Since ENRE 602 is only offered in Fall semesters, ENRE students who are admitted in the Spring semester may substitute ENRE 447 for ENRE 602 but are then required to take ENRE655 at some point during their graduate career.

- No more than 30 credits of ENXX courses remaining for the B.S.
- No more than 6 credits of CORE/Gen Ed requirements remaining for the B.S.
- Submit the Combined Bachelor's/Master's Degree form to the Graduate School at: https://gradschool.umd.edu/forms

Students wishing to apply to this program should contact the Mechanical Engineering Graduate Office.

4.7.3. **Credit and Thesis Requirements.** The same as the M.S. with thesis degree.

4.8. **Ph.D. in Mechanical Engineering.**

4.8.1. **Credit Requirements.** Students enrolled in the Ph.D. Program in Mechanical Engineering must complete a minimum of 36 coursework credits beyond the bachelor's degree and 12 Ph.D. research/thesis credits completed after admission to candidacy.

4.8.1.1. At least 12 coursework credits must be taken at the University of Maryland as a Ph.D. student.

4.8.1.2. At least 6 coursework credits must be from an approved list of mathematics courses (see Appendix E).

4.8.1.3. Students currently holding an M.S. from an approved engineering, math, or science program may apply up to 24 credits from their previous degree towards their doctoral coursework requirement.

4.8.2. **Doctoral Dissertation.** Completion of a dissertation prepared according to the guidelines in the current edition of the University's Thesis and Dissertation Style Guide.

4.9. **Ph.D. in Reliability Engineering.**

4.9.1. **Credit Requirements.** Students enrolled in the Ph.D. Program in Reliability Engineering must complete a minimum of 36 coursework credits and 12 Ph.D. research/thesis credits (ENRE 899) completed after admission to candidacy.

4.9.1.1. At least 30 coursework credits must be courses at the 600-level or above.

4.9.1.2. The *core courses* ENRE 600 Fundamentals of Failure Mechanisms and ENRE 602[1] Principles of Reliability of Analysis must be completed with at least a 3.5 GPA.

4.9.1.3. At least 6 of the courses must be ENRE courses.

4.9.2. **Doctoral Dissertation.** Completion of a dissertation prepared according to the guidelines in the current edition of the University's Thesis and Dissertation Style Guide.

5. M.S. and Ph.D. Satisfactory Academic Progress[2]

5.1. **Definition.** Satisfactory academic progress is defined in terms of the following elements:

- A high level of *academic achievement* in a coherent program of coursework relevant to the student's research.
- A *scholarly output* that is recognized by the Department as being of a quality, magnitude, and depth appropriate for the degree.
- Timely *meeting of deadlines* for advancing through the program.

5.2. **Plan of Study.** The program of coursework must be described in a formal *Plan of Study* that is approved by the student's advisor and by the Director of Graduate Studies prior to the second semester of study. Courses that are not on an approved Plan of Study may not count toward the degree. Any changes to the approved Plan of Study must be approved by the student's advisor and by the Director of Graduate Studies prior to their implementation.

5.2.1. **400-level courses.** No ENME 400-level courses may be included on a Plan of Study. Plans of Study that include 400-level courses from outside the Department must be

[2] Academic progress milestones and expectations for professional degrees (M.Eng.) are addressed in the MAGE web page at: https://mage.umd.edu.

accompanied by a statement from the advisor justifying their inclusion of the course and approved by the Director of Graduate Studies prior to taking the course.

5.2.2. **GPA requirements.** All students must maintain a GPA of at least 3.0 in all courses that have been taken for graduate credit as part of their Plan of Study since enrollment in the degree program. To be eligible for the Qualifying Exam, students in the Reliability Engineering Ph.D. program must obtain a GPA of at least 3.5 in the *core courses* associated with that degree.

5.3. **Scholarly Output.**

5.3.1. **M.S. With Thesis.** For students completing an M.S. with thesis, the scholarly output is in the form of a *thesis* describing their research. The thesis is presented formally at an oral defense, conducted in English and partially open to the public, and must be approved by the student's Thesis Committee for the degree to be awarded.

5.3.2. **M.S. Without Thesis.** For students completing an M.S. without thesis degree, the scholarly output is in the form of a *scholarly paper* describing scholarship by the student. The scholarly paper must be approved by the student's advisor and Graduate Program Office for the degree to be awarded.

5.3.3. **Ph.D. Dissertation.** For students completing a Ph.D. degree, the scholarly output is in the form of a dissertation describing their research. The dissertation is presented formally at an oral defense, conducted in English, partially open to the public, and must be approved by the student's Dissertation Committee for the degree to be awarded.

5.3.4. **Expectations.** The distinctions between a thesis and a dissertation are a) in the extent of the scholarship, b) the degree to which the student's independent research makes fundamental contributions to the student's field of inquiry, and c) the degree to which the scholarship has been or is likely to be published in archival journals, with significantly higher expectations applied to dissertations than theses. As a general guideline, students in a Ph.D. program should average one refereed publication per year that they are in the program after their first year. Each student shall present a list of "accepted/in-press", "published", "submitted", and "to be submitted" publications at the time they defend their dissertation proposal. The student's Dissertation Committee shall use this information to decide by unanimous approval the appropriate number and type of publications that should be completed prior to the dissertation defense. This number may be subsequently reduced only with unanimous approval of the Dissertation Committee.

5.4. **Ph.D. Qualifying Exam.** The qualifying exam is an oral exam conducted in English. The goals of the exam are to i) determine the student's ability to understand and apply fundamental concepts in their technical area, ii) determine the student's aptitude and ability to conduct original and independent research at the doctoral level, iii) assess the student's familiarity with and ability to critically review previous work from the literature, iv) assess the student's ability to communicate ideas with clarity and depth, and iv) identify areas in the student's background that need strengthening as the student makes progress in their doctoral studies.

5.4.1. **Mechanical Engineering.** Students who matriculate with an M.S. degree from an approved engineering, math, or science program must take the qualifying exam no later than their second semester of study in the program. Students who matriculate with a B.S. degree must take the qualifying exam no later than their fourth semester of study at the University of Maryland, or the semester following the semester in which they have accumulated at least 24 coursework credits, whichever occurs first.

5.4.2. **Reliability Engineering Qualifying Exam.** Students are expected to take the qualifying exam as soon as possible after the completion of 18 credits of graduate ENRE coursework, including the completion of the core course requirement, with a GPA of at least 3.5.

5.4.3. **Number of Attempts.** Students who do not pass the qualifying exam during their first attempt may, upon the recommendation of their examining committee and review by the Director of Graduate Studies, attempt the exam a second time during the same semester. Under no circumstances will a student be given more than two attempts to pass the qualifying exam. Students who do not pass the qualifying exam will be provided graduate status for one additional semester, after which their graduate admission will be terminated.

Under no circumstances will such students be considered for readmission into the Ph.D. program.

5.4.4. **Delayed Qualifying Exam.** Deferral of the qualifying exam due to unusual circumstances must be approved by the Graduate Office following the submission of a request for a departmental exception by the student: https://megrad.umd.edu/studentforms/

5.5. **Ph.D. Candidacy.** Once a student has passed their qualifying exam, completed the coursework in their Plan of Study, and obtained approval for their dissertation proposal, the student is admitted to Ph.D. candidacy. Students must be admitted to candidacy within two (2) semesters of passing the qualifying exam and at least six (6) months prior to the date on which their Ph.D. degree will be conferred.

5.5.1. **Mechanical Engineering with M.S.** Students in the Mechanical Engineering Ph.D. program who matriculated with an M.S. degree from an approved engineering, math, or science program must present their doctoral dissertation proposal no later than the end of the fourth (4) semester following matriculation. In the event the proposal is not approved, the student will be given until the end of the fifth (5) semester to gain the approval of a proposed dissertation topic.

5.5.2. **Mechanical Engineering with B.S.** Students in the Mechanical Engineering Ph.D. program who matriculate with a B.S. degree, or whose admission status is changed from the M.S. program to the doctoral program, must present their doctoral dissertation proposals later than the end of the sixth (6) semester following their matriculation into the Ph.D. or M.S. program, whichever occurs first. In the event the proposal is not approved, the student will be given until the end of the seventh (7) semester to gain the approval of a proposed dissertation topic.

5.5.3. **Lack of Approved Dissertation Topic.** Students who are unable to secure the approval of a proposed dissertation topic within the time limits set forth above will not be allowed to continue in the Ph.D. program. Such students will be permitted to remain in the program for one additional semester, after which their graduate admission will be terminated. Under no circumstances will such students be considered for readmission into the doctoral program.

5.5.4. **Reliability Engineering.** Reliability Engineering students must present their doctoral dissertation proposals no later than two semesters following their completion of the Qualifying Examination. In the event the proposal is not approved, the student will be given one additional semester to gain the approval of a proposed dissertation topic.

5.5.5. **Extensions**. Extensions to time limits for candidacy may be granted by the Graduate School under certain circumstances.

5.6. **Ph.D. Seminar Requirement.** In addition to coursework, all on-campus full-time Ph.D. students are required to attend a minimum of eight (8) seminars in each of the fall and spring semesters. The list of seminars attended by the student must be approved by the advisor at the end of the semester, and that approval will be necessary in addition to other metrics for satisfactory progress in the program. Off-campus and part-time doctoral students are encouraged to attend seminars, whenever possible, and share this information with their respective doctoral advisors.

5.7. **M.S. Time Limits.** All M.S. degree requirements must be completed within a five (5)-year period. Time taken for an approved Leave of Absence for Childbearing, Adoption, Illness or Dependent Care does not count toward this five-year limit. This time limit applies to all coursework, including transfer credits from other institutions.

5.7.1. **Revalidation of Coursework.** Under extraordinary circumstances, a request to revalidate coursework outside of the five-year period may be submitted to the Graduate Office, provided that all Graduate School requirements for these courses are met. Revalidation of non-UMD courses will not be allowed by the Department.

5.8. **Ph.D. Time Limits.** Ph.D. students must be admitted to candidacy within five (5) years of matriculation in the Ph.D program and must complete all Ph.D. degree requirements, including the dissertation defense, within four (4) years after admission to candidacy. Time taken for an approved Leave of Absence for Childbearing, Adoption, Illness or Dependent

Care does not count toward these time limits.

6. Advisor

6.1. **Assignment.** All students are admitted with an advisor who is a Full or Associate Member of the Graduate Faculty affiliated with the student's degree program.

6.1.1. **Mechanical Engineering Graduate Faculty.** A list of the current Graduate Faculty in Mechanical Engineering is at: *https://academiccatalog.umd.edu/graduate/programs/mechanical-engineering-enme/#facultytext*

6.1.2. **Reliability Engineering Graduate Faculty.** A list of the current Graduate Faculty in Reliability Engineering is at: *https://academiccatalog.umd.edu/graduate/programs/reliability-engineering-enre/#facultytext*

6.1.3. **Non-UMD Faculty Advisors.** Non-UMD Graduate Faculty members may advise graduate students in some cases; please consult with the Graduate Office if this is the case.

6.2. **Changes.** Advisor changes after matriculation must be approved by the Graduate Office. Research credits can only be earned in a student's research advisor's 799, 898, or 899 section. Contact the Graduate Office for additional details.

6.3. **Role.** The advisor guides the student in their coursework and research. For Research Assistants, the advisor is typically the faculty member providing the student's financial support. Students should consult with their advisor prior to registering for any courses.

7. Examining Committees

7.1. **M.S. Thesis Committee.** The Thesis Committee serves as the examining committee that conducts final review of a student's thesis.

7.1.1. **Composition.** A Thesis Committee must consist of at least three (3) Members of the Graduate Faculty, with a minimum composition of three (3) Full or Associate Members, at least two (2) of whom must be Full Members.

7.1.2. **Additional Members.** Additional members, including those who are not Full or Associate Members of the Graduate Faculty, may be appointed to the Thesis Committee with permission of the Graduate Office. Such appointments may be motivated by the multidisciplinary nature of the student's scholarship or required in special circumstances.

7.1.3. **Special Members.** Appointment of members to the Thesis Committee who are not currently members of the Graduate Faculty, for example, scientists from outside of the University, requires submission of the individual's CV to the Graduate Office at least eight (8) weeks prior to the date of the thesis defense.

7.1.4. **Nominations.** The members of the Thesis Committee must be nominated at least six (6) weeks prior to the thesis defense by submission of the *Nomination of Thesis or Dissertation Committee* form. This form must be submitted to the Graduate Office for approval and forwarding to the Office of the Registrar. Subsequent changes in a Thesis Committee may be made at any time with the approval of the advisor, the Director of Graduate Studies, and the Graduate School. The Graduate School has further information on deadlines for submission of the *Nomination of Thesis or Dissertation Committee* form in the event of such changes.

7.1.5. **Chair.** The advisor typically serves as the student's Thesis Committee Chair.

7.2. **Ph.D. Dissertation Committee.** The Dissertation Committee serves as the examining committee that conducts review of a student's dissertation-proposal and dissertation, advises and aids the student in completing their program of study, advises the student in their research activity as appropriate, and evaluates the student's progress.

7.2.1. **Composition.** A Dissertation Committee must consist of at least five (5) Members of the Graduate Faculty, with a minimum of four (4) Full or Associate Members, at least three (3) of whom must be Full Members.

7.2.2. **Dean's Representative.** One of the members of a Dissertation Committee is appointed by the Dean of the Graduate School. The Dean's Representative should have some background or interest related to the student's research; be from a department other than

the student; be tenured with a tenure home that is different from that of the Chair of the

Committee, the student's advisor, and the student; and be a Member of the Graduate Faculty.

7.2.3. **Additional Members.** Additional members, including those who are not Full or Associate Members of the Graduate Faculty, may be appointed to the Dissertation Committee with permission of the Graduate Office. Such appointments may be motivated by the multidisciplinary nature of the student's scholarship or required in special circumstances.

7.2.4. **Nominations.** The members of the Dissertation Committee must be nominated at least six (6) weeks prior to the thesis defense by submission of the *Nomination of Thesis or Dissertation Committee* form. This form must be submitted to the Graduate Office for approval and forwarding to the Office of the Registrar. Subsequent changes in a Dissertation Committee may be made at any time with the approval of the advisor, the Director of Graduate Studies, and the Office of the Registrar. The Graduate School has further information on deadlines for submission of the *Nomination of Thesis or Dissertation Committee* form in the event of such changes.

7.2.5. **Chair.** The Chair of a Dissertation Committee must be a Full Member of the Graduate Faculty or, by special permission, an appointee of the Dean of the Graduate School. If the student's advisor qualifies, then they typically serve as the Dissertation Committee Chair.

7.3. **Ph.D. Qualifying Exam Committee.** See paragraph 9.4

7.4. **Ph.D. Dissertation Proposal Committee.** This committee is the same committee as the dissertation committee. See paragraph 7.2.

8. Transfer Credits

8.1. **M.S. Plan of Study.** An M.S. Plan of Study may include a maximum of 6 approved transfer credits for graduate coursework undertaken at other accredited U.S. institutions or foreign universities. The Graduate School must approve the transfer of credits; approval is sought through the submission of the *Transfer or Inclusion of Credit Form* to the Graduate School. Transfer of credits may be accepted provided that the coursework: (a) be no more than five academic years old at the time of graduation; (b) was taken for graduate credit; and (c) resulted in a grade of B- or better.

8.2. **From M.Eng. or B.S./M.S.** Course credits earned while an M.Eng. or B.S/M.S. student at the University of Maryland, College Park, must be transferred to the M.S. program by submitting the *Transfer or Inclusion of Credit Form* to the Graduate School.

8.3. **Ph.D. Plan of Study.** A Ph.D. Plan of Study may include a maximum of 24 approved transfer credits for graduate coursework at the 600-level or above, undertaken at other accredited U.S. institutions or foreign universities. The advisor and the Director of Graduate Studies must approve the transfer of credits. Transfer of credits may be accepted provided that appropriate official and verifiable documentation (transcripts and course descriptions) is available to confirm the level of work and that it will not be duplicated by courses taken at the University of Maryland. Research/thesis credits cannot be transferred.

9. Process for Ph.D. Qualifying Exams

9.1. **Requirement.** Each Ph.D. student must pass a qualifying exam to make satisfactory academic progress. A student is considered to have passed their exam only if the Examining Committee decides unanimously in favor of this outcome.

9.2. **Schedule.** Qualifying exams are scheduled in the Fall and Spring semesters. They are typically scheduled during February of the Spring semester and September of the Fall semester. If a student needs to retake the qualifying exam, they may do so during April of the Spring semester and November of the Fall semester.

9.3. **Mechanical Engineering Exam Subject Areas**. In consultation with their advisor and the Graduate Office, a student in the Mechanical Engineering Ph.D. Program will choose from an approved list of at least two and at most three independent, broad exam subject areas that reflect the student's background knowledge and key dissertation fields. Students will be asked to make this choice at the time they sign up for the exam, however, the subject area(s) for the exam are ultimately at the discretion of the Examining Committee.

9.4. **Committee Composition**. The Examining Committee consists of three Full or Associate Members of the Graduate Faculty, at least two of whom are affiliated with the corresponding Ph.D. program[3]. The Chair must be a Full Member of the Graduate Faculty.

9.4.1. **Committee Selection.** For a student's first attempt, the Examining Committee will be composed of the student's advisor, a Chair, and a third member. Co-advisors will be allowed to participate as silent observers during the first attempt. The members of the committee will be selected by the Director of Graduate Studies in consultation with the student's advisor. For the second exam administered to students who fail on their first attempt, the Director of Graduate Studies will form an entirely new committee in consultation with the student's advisor and, in the case of the Mechanical Engineering Ph.D. program, the relevant Division Leader.

9.5. **Venue and Date.** The student and the Examining Committee Chair are responsible for scheduling the qualifying exam date and venue in consultation with the committee and the Graduate Office, and for notifying the committee in a timely manner. In the event an exam cannot be administered as originally scheduled, due to extenuating circumstances (subject to approval by the Director of Graduate Studies and Examining Committee Chair), the student will provide copies of their presentation to the committee by the originally scheduled date and time. The exam will then be rescheduled for the earliest available date, preferably the next business day, but no more than two business days after the originally scheduled date. Should a time not be agreed upon for the exam to be held within two business days, the whole examination process will be reinitiated with a new topic assigned to the student. Exams conducted with the student and committee present in-person are preferred but hybrid exams are possible if, at a minimum, the student and one committee member are present in person. The Graduate Office should be notified in advance if any committee members are going to attend the qualifying exam virtually.

9.6. **Student's Background.** Each student must contact the Examining Committee Chair no later than two weeks before the Monday of the week that the qualifying exam is to be held, to make the necessary arrangements. The student should also provide the Examining Committee Chair with a folder that contains a) transcripts of undergraduate and graduate course work, b) M.S. thesis research topic, if applicable, and c) dissertation topic if known.

9.7. **Research Topic.** Ten (10) calendar days before the date that the qualifying exam is to be held, each student will be assigned a research topic and one to two references related to some aspect of one or more of the subject areas selected by the student. The topic will be selected by the Examining Committee Chair in consultation with the rest of the committee. This topic cannot be from the student's completed research but can be from an area that the student might address later during their dissertation research. A different exam topic must be selected for each student.

9.8. **Written Summary Report.** The student should study the assigned literature, as well as any other pertinent literature on the assigned topic, in order to be able to formulate research questions within the topic, suitable for doctoral-level investigation. The student should be able to outline their approach for carrying out such an investigation. The results of this study are to be summarized on one page, formatted as follows: single-spaced, 12-point type, and one-inch margins all around. The summary must consist of the following three paragraphs: a) a paragraph reviewing the pertinent literature on the assigned topic, b) a paragraph identifying a research issue related to the assigned topic area, that the student feels is worthy of doctoral-level research, and c) a paragraph describing a suitable research approach (experimental, numerical, and/or analytical) to address the research issue proposed by the student. References

[3] Up to one (1) Professional-Track-Faculty (PTK) member may serve on the qualifying exam committee, subject to the following constraints: The Professional Track-Faculty member cannot chair the qualifying exam committee and cannot serve on a committee with their supervisor.

should be provided and may extend onto a second page. The summary is to be submitted to each member of the Examining Committee by noon, three days prior to the scheduled exam.

9.9. **Oral Exam.** The student should prepare a brief presentation (using appropriate media) describing their literature review, statement of appropriate research problem, and proposed approach for addressing the stated research problem. For students in the Mechanical Engineering Ph.D. program, the exam will begin with a 15 to 20-minute presentation by the student. For students in the Reliability Engineering Ph.D. program, the exam will begin with a 30-minutes presentation (a maximum of 20 slides), and this will be the starting point for the oral exam discussion. The presentation may lead to questions (potentially broader than the assigned exam topic or, for students in the Mechanical Engineering Ph.D. program, the student's chosen exam subject areas) related to the goals of the exam. In general, the exam should take approximately one hour.

9.10. **Questions During Exam Preparation.** If the student has questions about their qualifying exam topic or procedural questions, they should direct those questions to the Examining Committee Chair. Students must NOT approach the other members of their Examining Committee (including their advisor) with questions about their qualifying exam topic or presentation. Violations of these guidelines may result in cancellation of the student's qualifying exam.

9.11. **Exam Outcome.** The Examining Committee will confer immediately after the exam, carry out deliberations about the exam outcome, reach a decision, and convey this decision through the Examination Committee Chair to the Graduate Office. The student will be notified of the outcome of the exam in writing by the Graduate Office. This notification may include conditions that the student would need to fulfill before attaining candidacy. Examples of these conditions include courses to be taken in a certain area. The committee may also provide other constructive feedback to the student on areas or skills that need to be strengthened. This is a possible outcome for students who are found to be qualified to conduct doctoral-level research, but who do not fare well on some aspect(s) of the exam for reasons that can be remedied.

10. Process for Ph.D. Dissertation Proposal

10.1. **Purpose.** The doctoral dissertation proposal is a formal presentation of the research the student plans to undertake as the basis for the Ph.D. dissertation. The dissertation proposal document must be prepared in written form under the guidance of the student's advisor and presented for approval to the student's Dissertation Committee. The purpose of the proposal presentation is for the Dissertation Committee to review the proposed research plan and provide feedback for refinement

10.2. **Requirement.** A dissertation proposal will be considered approved when signed by all committee members after the proposal presentation and submitted to the Graduate Office for inclusion in the student's file. The student's research should not be complete at this time, and the proposal presentation should not be treated as preparation for the Ph.D. defense.

10.3. **Schedule.** The dissertation proposal is to be submitted to each member of the Examining Committee by noon, one week prior to the scheduled proposal presentation.

10.4. **Document Format.** The dissertation proposal document should follow the dissertation format of the Graduate School, formatted as follows: single-spaced, 12-point type, and one-inch margins all around. The content should be organized as follows:

- Motivation
- Literature Survey
- Problem Statement
- Proposed Research
- Roadmap and timeline for completion of dissertation
- Plans for publishing, data sharing, and software sharing

10.5. **Presentation Format.** The dissertation proposal presentation shall not be public, but the Dissertation Committee may extend invitations to outside parties of their choosing.

ENME students: It is at the discretion of the Dissertation Committee whether the student must present their proposal to the whole committee on a single occasion or may present their proposal to individual members at different times. It is also at the discretion of the Dissertation Committee and Graduate Office whether such presentations should be 100% virtual, hybrid, or 100% in-person. The presentation should last between 20 and 30 minutes for a total duration between 1 and 1.5 hours, including question

ENRE students: The proposal is expected to be in-person, with Zoom attendance permitted only for committee members who are located outside the region. Exceptions can be made upon discussion with the graduate office, but the student, advisor, and majority of the committee must attend in person. For ENRE, students should plan for the total duration to be 1.5 hours.

10.6. **Application for Admission to Candidacy.** If the Dissertation Committee approves the student's proposal, the student shall submit to the Graduate Office a) a copy of their dissertation proposal, b) a copy of the cover page that includes the signatures of all committee members, handwritten or digital, c) a copy of their approved Plan of Study, and d) an Application for Admission to Candidacy (available at *https://gradschool.umd.edu/forms*). Applications must be received by the Office of the Registrar prior to the 25th of each month, in order for the advancement to be effective the first day of the following month.

10.7. **M.S. Along the Way.** Following admission to candidacy, students without an M.S. degree in their corresponding discipline may request to obtain an M.S. along the way by submitting an Approved Program Form and a Request for Inclusion or Transfer of Credits (if utilizing graduate credits not used for a previous graduate degree from another University or graduate program outside of ENME/ENRE). Courses older than five years old at the time of degree clearance must also be revalidated by the Graduate Office (courses older than five years old at the time of degree clearance from other universities will not be revalidated, and therefore cannot be counted towards an M.S. along the way). All forms must be submitted in a timely manner.

Students must also submit an Application for Graduation under the M.S. non-thesis option through Testudo by the deadline set by the Graduate School and ensure that they are registered for at least 1 credit in the term they expect to receive their degree. Students cannot receive two degrees in the same semester, so those who successfully apply for and obtain their M.S. along the way will need to apply for their Ph.D. degree clearance in a later semester.

11. Process for Thesis/Dissertation Defense

11.1. **Timeline.** Following the advisor's approval, a copy of the thesis/dissertation must be provided to each member of the Thesis/Dissertation Committee at least two (2) weeks prior to the date of the defense. In addition, two (2) weeks prior to the date of the defense, a notice that includes the defense date and time, location, title, abstract, and names of committee members, and that invites faculty and students to attend the public portion of the defense, must be sent to the Graduate Office for forwarding to departmental listservs and posting on the web.

11.2. **Virtual Committee Participation.** Thesis/dissertation defenses must be in-person with the student and their entire committee present. Under extenuating circumstances, permission to have virtual committee members for a thesis/dissertation defense may be granted by the Graduate School (the Department cannot grant waivers). A waiver can be requested by the student's advisor at: *https://gradschool.umd.edu/remotedefenserequest*

11.3. **Forms.** A few days before the examination is scheduled to take place, the University will send the Report of the Examining Committee Form (REC) to the committee (except for the Chair),. Upon passing the examination, the REC must be signed by each member of the examining committee and respective Director of Graduate Studies before automatically being routed to the Office of the Registrar for processing. Students should also fill out the Department's Exit Information form, which will be shared with graduating students at the end of each term.

11.4. **Previously Published Work.** If previously published work is included in the thesis or dissertation, the forward to the thesis or dissertation must state that the student made substantial contributions to the relevant aspects of the jointly authored work included in the thesis or dissertation; and a letter signed by the Director of Graduate Studies must be submitted with the thesis or dissertation: *https://megrad.umd.edu/*

12. Program and Degree Objective Changes

12.1. **M.S. thesis to M.S. non-thesis option.** Students pursuing a thesis-based M.S. degree may, under extenuating circumstances that precludes completion of the thesis, be permitted to complete the non-thesis M.S. option.

[4] Students fill out the EPUB form on their own if needed. The student is responsible for submitting the Approved Program Form to the Graduate Office via email before the deadline provided by the Registrar's office.

12.2. **Ph.D. to M.S.** Students pursuing a Ph.D. degree may, with the approval of their research advisor and the Graduate Office, change to an M.S. with-thesis option.

12.3. **Ph.D. to M.S. non-thesis option.** Students pursuing a Ph.D. degree may, under extenuating circumstances that precludes completion of the dissertation, be permitted to complete the non-thesis M.S. option.

12.4. **M.S. to Ph.D.** Students who wish to transfer from M.S. to the Ph.D. program must submit a new application to the Graduate School. M.S. students in their first four semesters of enrollment, with a GPA of at least 3.5, and at least 24 graduate coursework credits may take the Ph.D. qualifying exam. Students who pass and meet the admission requirements of the program will be recommended for direct admission to the Ph.D. program.

12.5. **M.S. or Ph.D. to M.Eng.** Students who wish to transfer from the Mechanical Engineering or Reliability Engineering M.S. or Ph.D. program to an M.Eng. or Certificate program may do so with the approval of the Graduate Office, and acceptance by the Director of the MAGE program. It is not necessary to submit a new application to the Graduate School. Transferring from an M.S. or Ph.D. program to an M.Eng. or Certificate program may result in the student losing their funding (teaching assistantship, research assistantship and/or fellowship).

12.6. **M.Eng. or Certificate to M.S. or Ph.D.** Students who wish to transfer from M.Eng. or Certificate programs into M.S. or Ph.D. programs must submit a new application to the Graduate School.

APPENDICES

A. Form Access

a. **Department of Mechanical and Reliability Engineering Forms.** Ph.D. Coursework Plan and M.S. Coursework Plan instructions can be found here: *https://megrad.umd.edu/*

b. **Graduate School Forms.** All Graduate School forms may be obtained from the Graduate School's web site at: *https://gradschool.umd.edu/forms* The Graduate School's web site provides the following forms:

- Request for Transfer or Inclusion of Credit for the Master's Degree
- Nomination of Thesis or Dissertation Committee
- Application for Admission to Candidacy
- Master's Degree Approved Program Form
- Petition for Graduate Degree Clearance/Missed Deadlines
- Petition for Waiver of Regulation
- Request for Time Extension

B. Academic Calendar

a. Visit: *https://academiccatalog.umd.edu/about-university/academic-calendar/*

C. Contact Information

Mechanical Engineering (ME) Graduate Office
2172 Glenn L. Martin Hall
Phone: 301-405-8681
Email: megrad@umd.edu

Director of Graduate Studies, Mechanical Engineering	Prof. Peter Sandborn Martin Hall 2174 Phone: 301-405-3167 Email: *sandborn@umd.edu*
Director of Graduate Studies, Reliability Engineering	Prof. Katrina Groth Martin Hall 0151B Phone: 301-405-5215 Email: *kgroth@umd.edu*
Director, Academic and Student Affairs	Kerri Poppler James Martin Hall 2180 Phone: 301-405-8601 Email: *kjames3@umd.edu*
Graduate Program Manager (Admissions and TAs)	Megan Wells Martin Hall 2170 Phone: 301-405-4216 Email: *mpetry@umd.edu*
Program Administrative Specialist (Current Students)	Segen Habte Martin Hall 2172 Phone: 301-405-8681 Email: *shabte@umd.edu*

Mechanical Engineering Office of the Chair

Department Chair	Professor Harry Dankowicz Martin Hall 2181 Phone: 301-405-3031 Email: *danko@umd.edu*
Assistant to the Chair	Nicholas Thompson Martin Hall 2181 Phone: 301-405-3031 Email: *nthomps3@umd.edu*

AY 2025-2026 Members of the Mechanical Engineering Graduate Committee

Professor Peter Sandborn
Professor Shapour Azarm
Professor Steven Gabriel
Professor Amr Baz
Professor Jin-Oh Hahn
Professor Johan Larsson
Professor Katrina Groth
Assistant Professor Cecilia Huertas Cerdeira

Additional Contact Information

Resource	**Contact Person**	**Telephone/Email**	**Office**
Conference Room Reservation	https://clarknet.eng.umd.edu/room-scheduling		
Accessibility and Disability Service	https://ads.umd.edu/	301-314-7682 adsfrontdesk@umd.edu	0106 Shoemaker Hall
	Department Liaison: Yancy Diaz-Mercado	301-405-6506 yancy@umd.edu	2104A Martin Hall
Keys & Key Cards	Nicholas Thompson, Assistant to the Chair	301-405-2410 nthomps3@umd.edu	2181 Martin Hall
Travel	ME Travel	metravel@umd.edu	2181 Martin Hall
IT	ME IT	meit@umd.edu	
Payroll and Human Resources	ME HR	mehr@umd.edu	2181 Martin Hall
Graduate School	Graduate Student Services	301-405-3466 gradschool@umd.edu	2123 Lee Bldg.
International Student and Scholar Services (ISSS)	International Student Services	301-314-0342	1126 H.J. Patterson Hall
Parking Permits	Department of Transportation Services (DOTS)	301-314-3687 transportation@umd.edu	8056 Regents Drive Building, (202)

Registration	Office of the Registrar	301-314-8240 registrar-graduate@umd.edu	Mitchell Bldg., Ground Floor
University ID Card	Office of the Registrar	301-314-8218 registrar-graduate@umd.edu	Mitchell Bldg., Ground Floor
Fellowship Payments	Kerri Poppler-James	301-405-8601 kajmes3@umd.edu	2180 Martin Hall
Financial Aid/ Student Accounts	Office of the Bursar	301-314-9000	1135 Lee Bldg.

D. M.S. in Mechanical Engineering Core Courses

- ENME 607: Engineering Decision Making
- ENME 610: Engineering Optimization
- ENME 690: Mechanical Fundamentals of Electronic Systems
- ENME 695: Design for Reliability
- Any ENRE courses satisfies the breadth requirement for an ENME student (except those ENRE courses cross-listed as ENME)
- ENME 632: Advanced Convection Heat Transfer
- ENME 633: Molecular Thermodynamics
- ENME 640: Fundamentals of Fluid Mechanics
- ENME 605: Advanced Systems Control
- ENME 662: Linear Vibrations
- ENME 664: Dynamics
- ENME 670: Continuum Mechanics

E. M.S. and Ph.D. Mechanical Engineering Math Coursework Requirements

a. MS Math Requirement. The MS mathematics requirement can be fulfilled by completing a minimum of one course from the following list:

- CMSC 460: Computational Methods
- CMSC 467: Intro to Numerical Analysis II
- MATH 403: Intro to Abstract Algebra
- MATH 404: Field Theory
- MATH 405: Linear Algebra
- MATH 432: Intro to Point Set Topology
- MATH 436: Differential Geometry I
- MATH 437: Differential Geometry II
- MATH 452: Introduction to Dynamics and Chaos
- MATH 462: PDEs for Scientists and Engineers
- MATH 463: Complex Variables for Scientists and Engineers
- MATH 464: Transform Methods for Scientists and Engineers
- MATH 475: Combinatorics and Graph Theory
- STAT 410: Introduction to Probability Theory
- STAT 420: Introduction to Statistics
- STAT 440: Sampling Theory
- ENME 605: Advanced Systems Control
- ENME 610: Engineering Optimization
- ENME 625: Multidisciplinary Optimization
- ENME 700: Advanced Mechanical Engineering Analysis I
- ENME 722: Equilibrium Programming in Engineering
- ENME 725: Probabilistic Optimization
- ENME 741: Operations Research Models in Engineering
- ENME 745: Computational Methods in Science and Engineering
- ENME 750: Applied System Identification
- ENME 751: Applied Nonlinear Control
- ENRE 620: Mathematical Techniques of Reliability Engineering
- ENRE 655: Advanced Methods in Reliability Modeling

- Any MATH, STAT, or AMSC course at the 600 level or above.

Any variation from the lists above must be approved by the Director of Graduate Studies. For course descriptions, as well as a class schedule for the upcoming term, see *https://enme.umd.edu/course-schedule*

b. **Ph.D. Math Requirement.** The Ph.D. mathematics requirement can be fulfilled by completing a minimum of 6 credits from the following courses:
    - MATH, STAT or AMSC 600-level and higher.[5]
    - Any of the following:
        - ENME 605: Advanced Systems Control
        - ENME 610: Engineering Optimization
        - ENME 625: Multidisciplinary Optimization
        - ENME 700: Advanced Mechanical Engineering Analysis I
        - ENME 725: Probabilistic Optimization
        - ENME 745: Numerical Methods in Engineering
        - ENRE 620: Mathematical Techniques of Reliability Engineering
        - ENRE 655: Advanced Methods in Reliability Modeling

F. Glossary of Key Terms

a. **Graduate School.** (*https://gradschool.umd.edu/*) The Graduate School is a University-level administrative office that oversees all graduate studies at the University of Maryland.
b. **Graduate Office.** (*https://megrad.umd.edu/*) The Graduate Office is an administrative unit within the Department of Mechanical Engineering that implements policies from the Graduate School and oversees graduate students in Mechanical and Reliability Engineering.
c. **Transfer Credits.** Coursework credit transferred from another institution. These credits do not appear on a University of Maryland transcript and are not included in a student's GPA calculation.

[5] In some cases, STAT 400 may be approved for inclusion. If a student is planning to take STAT 400 they must obtain prior approval from the Graduate Office. Approval will require documentation from the student/advisor that shows that the student did not take an equivalent course during their undergraduate studies.