

Department of Mechanical Engineering at Texas A&M University

Graduate Degree Requirements

The Department of Mechanical Engineering at Texas A&M University offers Doctor of Philosophy (Ph.D.) and Master of Science (M.S. – Thesis Option) degrees. The University requirements for these degrees are available in the Texas A&M University Graduate Catalog (http://catalog.tamu.edu/pdfs/GRAD_catalog11_12.pdf). The departmental requirements for these degrees are given here. These departmental requirements do not supersede the University requirements.

Doctor of Philosophy (Ph.D.) Degree

The Doctor of Philosophy (Ph.D.) degree requires a minimum of 96 semester credit hours beyond a baccalaureate degree, and a minimum of 64 semester credit hours for a student who has completed a master's degree. A student in this program must pass the Qualifying Exams in two of nine areas, before the end of the student's second semester of study (not including summer), to continue. A student in this program is expected to pursue a Ph.D. degree, not another degree, in Mechanical Engineering.

Courses	Number of Courses	Semester Credit Hours
A Graduate-Level MATH or STAT course ¹	1	3
Other Courses ^{1,2}	5	15
MEEN 681 – Seminar	2	2
MEEN 691 – Research		44
Total Minimum Semester Credit Hours		64 (beyond M.S. degree)

¹ With the approval of student's dissertation advisor

² These courses may not include undergraduate courses or two core courses that are required for a master's degree. A student in this program who does not have a master's degree needs eight additional courses and another seminar course, as required for the M.S. degree.

Ph.D. Qualifying Examinations --- The purpose of the Ph.D. Qualifying Exams is to ensure that students pursuing a doctoral degree in Mechanical Engineering have a required background in at least two fundamental areas of mechanical engineering. In addition, the Qualifying Exams serve as a quality-control instrument.

Beginning in fall 2010, the Department of Mechanical Engineering offers Qualifying Exams in nine areas --- **controls, design, fluid mechanics, heat transfer, metals/ceramics, polymers, solid mechanics, thermodynamics, and vibrations**. A graduate student is required to pass the exams in any two areas to become eligible for Ph.D. candidacy.

A doctoral student is allowed a maximum of two attempts to pass each of the two exams, and is required to make his/her first attempt to pass the Qualifying Exams before he/she has completed 18 semester credit hours, including MEEN 691 Research hours. In other words, a doctoral student is required to make his/her first attempt to pass the exams in two areas in the second semester (not including summer sessions) of his/her doctoral study. If a student fails an exam, he/she must attempt to pass the exam the next time the Qualifying Exams are offered. A master's student is allowed to make one attempt to pass the Qualifying Exams. A doctoral student who fails in one or both of the exams fails the Ph.D. Qualifying Exams. A doctoral student who fails the Ph.D. Qualifying Exams may (a) switch to a master's program in Mechanical Engineering (provided that he/she does not have a master's degree in Mechanical Engineering from Texas A&M University), (b) pursue a Ph.D. degree in another department at Texas A&M or another institution, or (c) appeal to the departmental Graduate Studies Committee. The Graduate Studies Committee will consider appeals only under extraordinary circumstances, and not as a matter of routine.

The Ph.D. Qualifying Exams are administered during the third week of the fall and spring semesters every year, but not during the summer sessions. Students may register for these exams by contacting Ms. Missy Cornett, Senior Graduate Advisor, in Room 503-MEOB, or by completing a "Ph.D. Qualifying Exam Request" [form](#), which is available online and submitting it to Ms. Cornett. To prepare for an exam, students may obtain a copy of the previous three exams in the area from Ms. Cornett.

A three-member committee prepares the questions/problems for the exam in each area. The appropriate Division Leader appoints the chair and the two members of the committee. The Mechanical Engineering faculty is encouraged to submit problems along with their solutions for any of the exams to the committee that is responsible for the exam. The three-member committee may choose to include these problems in the exam. All exams are closed-book, but formula sheets, charts, and tables may be provided. The chair of each committee will ensure that the exam is reasonable and is consistent with previous exams.

To pass an exam, a student must score 70% or higher. A student scoring between 50% and 70% may be asked to take a follow-up oral exam. A student scoring 50% or lower fails the exam. A doctoral student who fails to pass an exam on his/her second attempt will be given an oral exam in which the student will have a final attempt to pass the exam.

A student must write a registration number that he/she is assigned on his/her exam paper. Nowhere on the exam is a student allowed to write his/her name or student identification number. In addition, students will not be given the names of the members of the committees responsible for the exams before the exams are over.

The Qualifying Exams are administered on a Monday. The committees will complete the grading of the exams by Wednesday. On Wednesday, the Graduate Program Director will meet with the chairs of the committees to discuss the results of the exams. If

oral exams are needed, they will be given on Thursday. In the morning on Friday, the chair of each committee will inform the Graduate Program Director of the results of the exam in a memo or an email. A committee may choose to give a student a conditional pass for which the student must satisfy certain requirements by the end of a given period after the exam, specified by the committee. In the afternoon on Friday, the Graduate Program Director will inform students the results of the exams in writing.

The percentages of students who passed the exams over the past several years are shown in the following table.

	Controls	Design	Fluid Mechanics	Heat Transfer	Metals	Polymers	Solid Mechanics	Thermodynamics	Vibrations
Fall 2007	75%		46%	57%			43%	25%	33%
Spring 2008	40%		47%	54%			43%	67%	67%
Fall 2008	75%		44%	66%			66%	60%	80%
Spring 2009	55%		67%	50%	82%	---	33%	56%	62%
Fall 2009	75%		50%	69%	50%	60%	20%	100%	93%
Spring 2010	31%		38%	58%	67%	100%	30%	32%	67%
Fall 2010	38%	100%	38%	88%	78%	20%	71%	65%	78%
Spring 2011	73%	67%	67%	55%	75%	43%	50%	55%	83%
Fall 2011	67%	50%	67%	50%	33%	67%	100%	67%	75%

Master of Science (M.S.) Degree – Thesis Option

The Master of Science (M.S.) degree with the thesis option requires a minimum of 32 semester credit hours. A thesis is required, and a student in this program is not allowed to change to a non-thesis master's degree program.

Courses	Number of Courses	Semester Credit Hours
A Graduate-Level MATH or STAT course ¹	1	3
Required Core Courses ¹ (see list)	2	6
Other Courses ^{1,2}	5	15
MEEN 681 – Seminar	1	1
MEEN 691 – Research		7
Total Minimum Semester Credit Hours		32

¹ With the approval of student's thesis advisor

² These courses may include up to two MEEN senior electives (6 semester credit hours), up to 4 semester credit hours of MEEN 685, and other graduate courses with the approval of the student's advisory committee and the Graduate Program Director.

Core and Suggested Mathematics Courses --- A Master of Science student is required to take two of the following ten designated core courses:

- **MEEN 603** – Theory of Elasticity
- **MEEN 607** – Polymer Physical Properties, or **MEEN 635** – Flow and Fracture of Polymeric Solids
- **MEEN 608** – Continuum Mechanics
- **MEEN 613** – Engineering Dynamics
- **MEEN 615** – Advanced Engineering Thermodynamics
- **MEEN 617** – Mechanical Vibrations
- **MEEN 621** – Fluid Mechanics
- **MEEN 630** – Intermediate Heat Transfer
- **MEEN 651** – Control System Design
- **MSEN 601** – Fundamental Materials Science Engineering

A Master of Science student may take [MATH 601](#) – Methods of Applied Mathematics I, [MATH 603](#) – Methods of Applied Mathematics II, [STAT 601](#) – Statistical Analysis, or another graduate mathematics or statistics course, with the approval of the student's thesis advisor. A Doctoral student may take [MATH 602](#) – Methods and Applications of Partial Differential Equations, or another graduate mathematics or statistics course, with the approval of the student's dissertation advisor.