

# Graduate Program in Mechanical Engineering at Texas A&M University

## Graduate Degree Requirements

The Department of Mechanical Engineering at Texas A&M University offers Master of Science (M.S.), Master of Engineering (M.Eng.), Doctor of Philosophy (Ph.D.), and Doctor of Engineering (D.Eng.) degrees. The University requirements for these degrees are available in the Texas A&M University Graduate Catalog and at [http://www.tamu.edu/admissions/catalogs/GRAD\\_catalog08\\_09/index.htm](http://www.tamu.edu/admissions/catalogs/GRAD_catalog08_09/index.htm). The departmental requirements for these degrees are given here. These departmental requirements do not supersede the University requirements.

### 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 student in this program is not allowed to change to a non-thesis master's degree program.

Courses	Number of Courses	Semester Credit Hours
MATH 601 or MATH 603 (or STAT 601)	1	3
Required Core Courses (see list)	2	6
Other Courses*	5	15
MEEN 681 – Seminar	1	1
MEEN 691 – Research		7
<b>Total Minimum Semester Credit Hours</b>		<b>32</b>

\*These courses may include up to 6 semester credit hours of MEEN senior electives, 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.

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

The Master of Science (M.S.) degree with the non-thesis option requires 36 semester credit hours of course work. A final comprehensive examination is required, and no exemption is allowed.

Courses	Number of Courses	Semester Credit Hours
MATH 601 or MATH 603 (or STAT 601)	1	3
Required Core Courses (see list)	2	6
Other Courses*	9	27
<b>Total Minimum Semester Credit Hours</b>		<b>36**</b>

\*Other courses may include up to 6 semester credit hours of MEEN senior electives, up to 8 semester credit hours MEEN 685, and other graduate courses with the approval of the student's advisory committee and the Graduate Program Director. Students pursuing this option are not allowed to enroll in MEEN 691.

\*\*A minimum of 18 semester credit hours must be MEEN/MSEN/MEMA 600 level courses.

**Core and Required Mathematics Courses** --- Every M.S. or M.Eng. student is required to take two (2) of the following ten (10) designated core courses:

- **MEEN 603** (or **MEMA 601**) – Theory of Elasticity
- **MEEN 607** – Polymer Physical Properties, or **MEEN 635** (or **MEMA 607**) – Flow and Fracture of Polymeric Solids
- **MEEN 608** (or **MEMA 602**) – Continuum Mechanics
- **MEEN 613** – Engineering Dynamics
- **MEEN 615** – Advanced Engineering Thermodynamics
- **MEEN 617** – Mechanical Vibrations
- **MEEN 621** – Fluid Mechanics
- **MEEN 630** – Intermediate Heat Transfer, or **MEEN 628** – Heat Transfer - Convection
- **MEEN 651** – Control System Design
- **MSEN 601** – Fundamental Materials Science Engineering

Master of Science and Master of Engineering students should take [MATH 601](#) – Methods of Applied Mathematics I or [MATH 603](#) – Methods of Applied Mathematics II. Doctoral students should take [MATH 602](#) – Methods and Applications of Partial Differential Equations.

### Master of Engineering (M.Eng.) Degree

The Master of Engineering (M.Eng.) degree is a 30-semester-credit-hour program involving only course work. A Master of Engineering student is required to:

- take or show equivalency in MATH 601 – Methods of Applied Mathematics I
- take two (2) of the ten (10) core courses and up to two (2) MEEN senior electives
- take at least three additional MEEN/MSEN/MEMA 600 level courses, exclusive of 681, 684, 685 and 692
- pass a final exam, unless the student submits a final exam exemption request, and obtains the approval of the student's Advisor and the Graduate Program Director for the exemption.

### 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.

Courses	Number of Courses	Semester Credit Hours
Minimum Formal Course Work*	6	18
MEEN 681 – Seminar	2	2
MEEN 691 – Research		44
<b>Total Minimum Semester Credit Hours</b>		<b>64 (beyond M.S. degree)</b>

\*These courses may not include MATH 601 (or MATH 603, or STAT 601), undergraduate courses, or two core courses that are required for a master's degree in Mechanical Engineering.

**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 (2) fundamental areas of mechanical engineering. In addition, the Qualifying Exams serve as a quality-control instrument.

The Department of Mechanical Engineering administers Qualifying Exams in eight (8) areas --- **controls, fluid mechanics, heat transfer, metals/ceramics, solid mechanics, polymers, thermodynamics, and vibrations**. A graduate student is required to pass the exams in any two (2) areas to become eligible for Ph.D. candidacy.

A doctoral student (with G8 status) is required to make his/her first attempt to pass the Qualifying Exams before he/she has completed twenty-four (24) semester credit hours, including MEEN 691 (research) hours. In other words, a full-time doctoral student is required to make his/her first attempt to pass the exams in two (2) areas within the first twelve months of the beginning of his/her doctoral program. A doctoral student is allowed a maximum of two (2) attempts to pass each of the two exams. If a student fails an exam, he/she must attempt to pass the exam the next time the Qualifying Exams are offered. In addition, a master's level student (with G7 status) is allowed to make one (1) attempt to pass the Qualifying Exams. A doctoral student (with G8 status) 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), (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 ENPH-205-Office, 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 (with G8 status) 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	Fluid Mechanics	Heat Transfer	Materials	Metals	Polymers	Solid Mechanics	Thermo-dynamics	Vibrations
<b>Spring 01</b>	67%	50%	29%	100%			83%	0%	86%
<b>Fall 01</b>	67%	93%	50%	71%			33%	25%	63%
<b>Spring 02</b>	100%	40%	50%	100%			20%	20%	70%
<b>Fall 02</b>	0%	62%	33%	100%			67%	---	50%
<b>Spring 03</b>	100%	67%	67%	67%			43%	---	78%
<b>Fall 03</b>	40%	54%	60%	66%			33%	75%	87%
<b>Spring 04</b>	73%	69%	35%	86%			25%	86%	60%
<b>Fall 04</b>	56%	61%	69%	---			67%	---	80%
<b>Spring 05</b>	86%	64%	71%	50%			60%	40%	83%
<b>Fall 05</b>	50%	50%	43%	100%			0%	100%	83%
<b>Spring 06</b>	66%	79%	82%	100%			25%	66%	57%
<b>Fall 06</b>	100%	20%	33%	50%			29%	100%	80%
<b>Spring 07</b>	57%	45%	40%	60%			80%	57%	88%
<b>Fall 07</b>	75%	46%	57%	100%			43%	25%	33%
<b>Spring 08</b>	40%	47%	54%	90%			43%	67%	67%
<b>Fall 08</b>	75%	44%	66%	71%			66%	60%	80%
<b>Spring 09</b>	55%	67%	50%		82%	---	33%	56%	62%

## Doctor of Engineering (D.Eng.) Degree

Information about the Doctor of Engineering (D.Eng.) degree may be obtained from <http://essap.tamu.edu/engr/>. The Doctor of Engineering degree program is administratively managed by the Engineering Student Services and Academic Programs (ESSAP) Office in the Dwight Look College of Engineering. For answers to general questions about the degree program, please contact:

Ms. Deanna Rodriguez  
 Administrative Coordinator, Engineering Graduate Studies  
 Engineering Student Services and Academic Programs  
 204 Zachry Engineering Center  
 3127 - Texas A&M University  
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 Telephone: (979) 845-7200  
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Specific questions about the Doctor of Engineering degree program options or degree plan should be directed to the Department Coordinator in Mechanical Engineering:

Dr. Warren Heffington  
 Associate Professor  
 Department of Mechanical Engineering  
 3123 - Texas A&M University  
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