Graduate Student Handbook

DOCTOR OF PHILOSOPHY
IN
MECHANICAL ENGINEERING

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The University of Texas at Dallas

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Doctor of Philosophy in Mechanical Engineering

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Key: ~~Old Content~~ New Content

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Introduction

The faculty, staff and students in the Mechanical Engineering Program would like to welcome you to the doctoral program in Mechanical Engineering. This handbook is designed to provide information on policies and procedures in the Ph.D. program. This handbook, the UTD Graduate Student Guide, the Graduate Catalog and the Mechanical Engineering Department website will serve as sources of information for you as you progress through our program. This is not an official document or supplement to the University catalog or other official publications. For official University policy regarding graduate studies, please see the UTD Graduate Student Guide online at: http://www.utdallas.edu/dept/graddean/gsGuide.htm and the UTD Graduate Catalog: http://catalog.utdallas.edu/

This handbook is subject to change in accordance with university and program amendments. Students are responsible for remaining updated and in compliance with policies throughout their attendance in the program and prior to graduation applications being processed. The policies set forth in this handbook default to new university policies that may be amended without notice. When changes occur, we will do our best to notify you in a timely manner. Check your UTD e-mail regularly. If there are questions not answered in this handbook or if you are unsure about policies and procedures, please contact the Mechanical Engineering Graduate Program Administrator.

Graduate Program Objectives

The Ph.D. program in Mechanical Engineering at the University of Texas at Dallas is offered as a part of a unique collaboration with the University of Texas at Arlington. The educational objective of the joint doctoral program is to prepare talented doctoral students for careers in which they will create new technologies and processes for the design, manufacturing, and operation of components and systems involving mechanical function (e.g., motion, structural, thermal, fluidic) at all size scales. Given the key enabling role of mechanical engineering in all areas of technology, the graduates of this program will be technical leaders in emerging and existing industry in Texas, the Nation, and the world.

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Program Administration

The administration of the graduate program is divided among committees and individuals each having specific responsibilities. Their roles and responsibilities are described below. Two of the most important individuals with whom you will interact are your research advisor and the graduate program administrator. Their roles are described in the Advising section.

Area Faculty:
The faculty who participate in teaching and research supervision within a particular degree program constitute that program's Area Faculty. The Area Faculty are responsible for the program's curriculum and requirements, advising and mentoring, and evaluation of student performance and progress. Most faculty participate in more than one degree program.

Graduate Studies Committee:
The role of the Graduate Studies Committee is to serve the needs of the graduate students and faculty in the department. It plays a role in developing, implementing, and monitoring policies and procedures including admissions, course scheduling, and the evaluation on qualifying papers and projects. Committee membership changes periodically.

Associate Department Head for Graduate Studies:
The Associate Department Head for Graduate Studies (Dr. Hongbing Lu) chairs the Graduate Studies Committee and oversees the graduate program.

Advising:

Research Advisor: The research advisor is the primary faculty member with whom the student works. The research advisor provides mentoring in research, guidance in course selections, assists in the preparation of the degree plan and Milestones Agreement Form, and career guidance. The research advisor supervises and must sign off on the student's completion of the qualifying exam and other documents, such as proposals and papers leading up to degree completion. In general, all new students have selected or have been selected by a research advisor upon admission to the program. Under circumstances where a student is admitted to the Ph.D. program without an assigned research advisor, the student will be given until their second semester in the program to locate a research advisor. In the event that a student must change research advisors, the student will be given no more than one semester to locate a new research advisor before being dismissed from the program.

Graduate Program Administrator: The mechanical engineering graduate program administrator may be consulted on any matter pertaining to doctoral study. Issues related to degree requirements, program procedures, credit transfers, and other student academic issues should be addressed to the graduate program administrator. Currently, the mechanical engineering graduate program administrator is Ashley Bradberry.

Getting Started in the Program

Orientation for International Students

All F-1 and J-1 visa holders must attend an International Student Orientation session. There will be multiple sessions offered leading up to the start of each semester. Students should register for their orientation session as early as possible. This orientation is required before they can be advised and register for classes.

Department Orientation & Meeting Graduate Program Advisors

All new students are required to attend the Mechanical Engineering New Graduate Student Orientation prior to registering in courses. Official announcements and invitations to this orientation will be sent by email from the Mechanical Engineering Department. Prior to attending this orientation session, students should review this handbook, the semester ME course offerings, the ME section of the Graduate Catalog, and the ME department website, and have a plan for which courses they wish to take. At this orientation, students will meet with a faculty advisor, and have their courses approved for registration. Once a student has passed 9 hours of coursework and achieved at least a 3.0 GPA, the student will not be required to meet with the ME faculty advisor for the purpose of being advised for courses and cleared for registration.

Registration and Obtaining UTD Identification (ID) Card

Once the required orientation session(s) have been completed, students may register for courses with the ME graduate program administrator. After completing registration, students will be required to obtain a Comet Card, the official identification card for all UTD students, faculty and staff. This card allows the use of campus facilities and services.

Graduate Teaching and Research Assistants

Newly appointed TA's and RA's will be required to attend additional orientation sessions given separately by the Office of Graduate Studies and the Human Resources Office.

The Office of Graduate Studies orientation is a two day program. TA's must attend both days of this program and RA's must only attend the first day of the program.

The Human Resources Office will conduct a separate orientation for all new hires. Both TA's and RA's must attend the three hour session.

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Program Facilities

The Engineering and Computer Science Building and the new Natural Science and Engineering Research Laboratory provide extensive facilities for teaching and research. These include wind tunnels, material test systems, nanoindenter, impact facilities, ultra-high speed camera, motion capture system, force plates, elextromyography, rheometer, DMA, DSC, TGA, XPS, FTIR, NMR, TGA, DSC, XRD, μ-Raman, Fluorescence Spectrometer, FIB/SEM, and TEM. A Class 10000 microelectronics clean room facility, including e-beam lithography, sputter deposition, PECVD, LPCVD, etch, ash and evaporation, is available for student projects and research.

In addition to the facilities on campus, cooperative arrangements have been established with many local industries to make their facilities available to UT Dallas graduate engineering students. Students will also have the opportunity to work closely with researchers on the University of Texas at Arlington campus.

Machine Shop

The Mechanical Engineering Machine Shop gives students the experience of building custom mechanical components or systems for class assignments, research and industry sponsors. The shop houses 10 computer stations, several computer numeric control milling machines, welding machines, different types of saws, a plasma cutter and an air compressor.

University Facilities

A campus map can be found on the university website: http://www.utdallas.edu/maps/

Office of Graduate Studies

The Office of Graduate Studies is located in the Founders Annex corridor, at FA 3.104. The staff in this office can answer questions and supply the forms that students will need while they are enrolled here. Students will find helpful information and important deadlines on the Office of Graduate Studies website: http://www.utdallas.edu/dept/graddean/index.htm

Computer Labs

Computer Labs for student use can be found on campus in the following locations:
Engineering Open Access Lab (CN 1.206)
Solarium Engineering Open Access Lab (ECSN 4.324)

Eugene McDermott Library

The McDermott Library is a valuable resource for all students; housing books, reference material, a copy center and study areas.

Multicultural Center

The Multicultural Center is committed to providing quality cultural programs, educational resources and support services to the UT Dallas community.

Health Center

A health center is available to meet medical needs of students. A full description of the services offered by the health center can be found on the university website:
http://www.utdallas.edu/healthcenter/

Student Counseling Center

The Student Counseling Center provides programs and services designed to assist students with managing academic and personal demands more effectively.

Student Union

The Student Union has numerous facilities and offices of interest to all students. In it are four private meeting rooms, lounges, three food service areas, billiards and table tennis, and video game room. The Union is also home to the Comet Center, the Student Union and Activities Advisory Board (SUAAB), Child Care Center and Student Government. The Student Union offers opportunities for students, faculty and staff to relax, eat, have fun, learn, socialize and become an active part of the UTD community.

Visitor Center and University Bookstore

The Visitor Center and University Bookstore building includes amenities such as a coffee shop, the Technology Store, the Copy Center and a multipurpose room.

Activity Center

The Activity Center is available to all students, faculty and staff and contains a fitness center, four racquetball courts, two squash courts, four basketball courts, and a 25-yard swimming pool.

Career Center

Career Center counselors are available to assist students with the preparations of job searching.
https://www.utdallas.edu/career/students/

Online Information Resources

Information on NetID/password issues, email accounts, wireless network setup and general information on computer related problems can be found on the Information Resources website: http://www.utdallas.edu/ir/

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Application and Admission to Graduate Program

Application Process

A student applying for admission to the Mechanical Engineering Graduate Program must submit an application form and relevant supporting documentation to the UTD Office of Admission and Enrollment Services to be considered for admission and any form of University and School support, such as teaching assistantships and research assistantships. Online submission of the application is now mandatory:
http://www.utdallas.edu/admissions/graduate/

It is the applicant's responsibility to see that all parts of an application have arrived at UTD. Application status and receipt of materials may be checked via the online Applicant Center in Galaxy: http://www.utdallas.edu/status/

Requirements for Admission

The Ph.D. in Mechanical Engineering is awarded primarily to acknowledge the student's success in an original research project, the description of which is a significant contribution to the literature of the discipline. Applicants for the doctoral program are therefore selected by the Mechanical Engineering Graduate Committee on the basis of research aptitude as well as academic record. Applicants for the doctoral program are considered on an individual basis.

The following are guidelines for admission to the Ph.D. program in Mechanical Engineering:

- A master's or bachelor's degree in engineering or one of the natural sciences from an accredited U.S. institution, or from a comparable international university
- A grade point average of 3.3 or better on a 4-point scale.
- GRE scores of 150, 160 and 4 for the verbal, quantitative and analytical components, respectively, are advisable based on our experience with student success (See also UTD requirements for English proficiency.)
- Three letters of recommendation from individuals who are familiar with the student's record, and are able to judge the candidate's probability of success in pursuing doctoral study in Mechanical Engineering.
- A statement of purpose describing motivation for doctoral study and how it relates to their professional goals.
- A detailed resume of all education and work history.
- All students originating from countries where English is not one of the official national languages must submit an acceptable English proficiency exam score. Minimum acceptable score guidelines can be obtained on the Graduate Admissions webpage for international students:
  http://www.utdallas.edu/admissions/graduate/international/toefl.php

Achievement of specified minimum scores on standardized tests is not sufficient to ensure admission. The ME program faculty may change these criteria in order to improve the quality of the ME Graduate Program.

Student's whose preparation is deficient in some respects will be required to take leveling or prerequisite courses. A student may use at most three semester credit hours of 5000-level courses in this category towards meeting the graduation requirements for the Ph.D. in Mechanical Engineering. This limitation does not apply to courses with 5xxx numbers that are not leveling courses.

For students who are interested in pursuing a Ph.D. but are unable to attend school full-time, there is a part-time option. The guidelines for admission to the program and the degree requirements are the same as for full-time Ph.D. students.

If a student was originally admitted into the program as a MS student and wishes to be considered for admission to the doctoral program upon completion of the MS, they must, at minimum, submit a new application and statement of purpose to the program by stated deadlines and be admitted into that program in accordance with the normal admission standards.

Non-Degree Seeking Option

Students who lack sufficient mechanical engineering background and/or fail to meet other program requirements may be eligible for admission under the Graduate Non-Degree Seeking program. A non-degree-seeking student must meet the same academic eligibility requirements and English proficiency requirements as degree seeking students. Non-degree-seeking students who are ultimately admitted to a degree program may transfer no more than 15 non-degree credit hours to that degree program. A new application must be submitted when transferring from non-degree to degree seeking status. Students should consult the graduate catalog for additional details on the non-degree seeking option.

Types of Admission

Conditional Admission

Conditional admission may be granted to applicants who are deficient in undergraduate course work considered essential for graduate study. Graduate students, admitted on a conditional basis, will be notified in their department welcome letter of the deficiencies that must be corrected in order to attain full graduate standing. Conditionally admitted graduate students must meet with the graduate program administrator each semester, prior to registration, to determine the remaining deficiencies in their academic program and have their course plan approved.

Funding Opportunities

Full-time graduate students have three options for financial assistance through the Department of Mechanical Engineering and all three are highly competitive. (Part-time students are not eligible for financial assistance.) Students desiring financial assistance are encouraged to apply to our graduate program as early as possible.

Jonsson School Graduate Study Scholarship is a $1,000 competitive, merit-based scholarship awarded to incoming graduate students during the fall semester. All students entering MS or PhD studies in mechanical engineering are eligible to apply. The Jonsson School Graduate Study Scholarship Application can be found on the Jonsson School Scholarship page online.

Teaching Assistants (TAs) are selected and supported by the Mechanical Engineering Department based on students' academic merit and prior research experience. After students have completed their first semester in the program, they may be considered by the department's selection committee for teaching assistantships. TA applications can be found on the Mechanical Engineering website and must be submitted to the Mechanical Engineering Department office or emailed to Ashley.bradberry@utdallas.edu.

Research Assistants (RAs) are supported by individual mechanical engineering faculty through faculty members' research grants. Prospective students may contact faculty members directly to discuss their research interests and possible RA support or they may submit an application to the Mechanical Engineering Department. RA applications can be found on the Mechanical Engineering website and must be submitted to the Mechanical Engineering Department office or emailed to Ashley.bradberry@utdallas.edu.

Time Limits: The maximum period of teaching assistantship support of students enrolled in a doctoral program is twelve semesters, whether long or summer, or one hundred doctoral level semester hours.

Registration

Students pursuing a full-time program of graduate study should register for a minimum of nine credit hours each long semester and six credit hours each summer semester (registration in summer semesters is optional). General registration requirements are available in the Graduate Catalog and on the University Registrar's website: http://www.utdallas.edu/student/registrar/

Prior to registering each semester, Ph.D. students should meet with their research advisor to discuss course selection. It may also be useful to meet with the graduate program administrator to discuss course options during the first two years, when students are completing core coursework.

After receiving approval from their research advisor, students that have completed nine hours of coursework and have at least a 3.0 GPA are permitted to register themselves online. Students may also register through the graduate program administrator by submitting a signed registration form or by emailing a complete registration request from their UTD email account. In the email, students must provide the course title and section, class number, instructor and semester of request. Email registration requests are only accepted if the above information is included and if the request is sent from their UTD email account.

Occasionally, there are "holds" placed on student accounts. Holds most commonly result from missing documents, unpaid fees, or financial aid issues. All holds must be resolved before the student can register. It is important that students review their account regularly and take care of any holds as quickly as possible.

Registration for Research and Dissertation Courses

Students are not permitted to register themselves in Research or Dissertation hours. Permission from the faculty member is required prior to registration in any of these courses. This approval can be supplied on a signed registration form or by attaching their approval in a registration request through email.

MECH 8V70 Advanced Research in Mechanical Engineering

MECH 8V99 Dissertation

Registration Change Procedure (Add/Drop)

Courses may be dropped online through the last day to withdraw, as designated by the Registrar on the Academic Calendar. Courses may be dropped without entry to the academic record until the date designated as such, normally within the first three weeks of the semester; after this date, the course will be graded W or F, at the discretion of the instructor.

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Degree Plan and Academic Standing

All students must submit an approved degree plan within the first three semesters of active enrollment in the program. The purpose of this plan is to show how and when requirements will be met. Degree plans should be initiated by the student and research advisor with the guidance of the ME associate department head. The degree plan is a working document and may be updated regularly to reflect the student's developing research focus and career goals. A degree plan demonstrating completion of all program requirements must be filed along with the application for graduation at the completion of the student's studies.

The Ph.D. program in Mechanical Engineering requires a minimum of 78 semester credit hours beyond the baccalaureate degree. The breakdown is shown in the table below.

Category	Semester Credit Hours
Required Courses	12
Prescribed Electives	12
Math electives	6
Free Electives	12
Dissertation	6 (minimum)
Other: Research in Mechanical Engineering	30 (minimum)
TOTAL	78 (minimum)

There are four technical areas of concentration in Mechanical Engineering, which are:

- Dynamic Systems & Control (DSC)
- Manufacturing & Design Innovation (MDI)
- Mechanics & Materials (MM)
- Thermal & Fluid Sciences (TFS)

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Students in the Mechanical Engineering Ph.D. program are expected to complete twelve hours of required courses. These twelve hours are made up of the program's four core courses. A student must receive a grade of B- or better in each of these required courses and maintain a GPA of at least 3.0 to remain in good standing and satisfy the degree requirements.

A Ph.D. student in ME must take one core course from each of the four concentration areas in the list below, and must receive a grade of B- or better in the four core courses.

Dynamic Systems and Control

MECH 6300 (EECS 6331, SYSM 6307) Linear Systems

MECH 6314 (SYSM 6306, BMEN 6372) Engineering Systems: Modeling and Simulation

Manufacturing and Design Innovation

MECH 6303 Computer Aided Design

Mechanics and Materials

MECH 6306 Continuum Mechanics

MECH 6350 Advanced Solid Mechanics

Thermal and Fluid Sciences

MECH 6370 Incompressible Fluid Mechanics

MECH 6373 Convective Heat Transfer

MECH 6374 Conductive and Radiative Heat Transfer

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A Ph.D. student in mechanical engineering must take at least four courses from the list of prescribed elective courses in one of the four areas of concentration. Upon approval from the student's research advisor and Mechanical Engineering Graduate Committee, a qualified student can take other courses offered by UT Dallas or UT Arlington to satisfy the requirements on prescribed electives. The following is a list of prescribed elective courses.

Dynamic Systems and Controls (DSC)
PhD students must take at least four courses from one concentration area.

MECH 6300 (EECS 6331, SYSM 6307) Linear Systems
MECH 6311 Advanced Mechanical Vibrations
MECH 6312 (EESC 6349) Random Processes
MECH 6313 (EECS 6336, BMEN 6388, SYSE 6324) Nonlinear Systems
MECH 6314 (SYSM 6306, BMEN 6372) Engineering Systems: Modeling and Simulation
MECH 6316 (SYSE 6322) Digital Control of Automotive Powertrain Systems
MECH 6317 (SYSM 6302) Dynamics of Complex Networks and Systems
MECH 6318 (SYSM 6305) Optimization Theory and Practice
MECH 6323 (SYSE 6323, EECS 6323) Robust Control Systems
MECH 6324 (EECS 6324) Robot Control
MECH 6V29 Special Topics in Controls and Dynamic Systems

Manufacturing and Design Innovation (MDI)
PhD students must take at least four courses from one concentration area.

MECH 6311 Advanced Mechanical Vibrations
MECH 6314 (BMEN 6372, SYSM 6306) Engineering Systems: Modeling and Simulation
MECH 6317 (EECS 6302, SYSM 6302) Dynamics of Complex Networks and Systems
MECH 6318 (SYSM 6305) Optimization Theory and Practice
MECH 6330 Multiscale Design and Optimization
MECH 6333 Materials Design and Manufacturing
MECH 6334 Smart Materials and Structures
MECH 6335 (OPRE 6340) Flexible Manufacturing Strategies
MECH 6337 (SYSM 6301) Systems Engineering, Architecture and Design
MECH 6341 (EEMF 6348, MSEN 6348) Lithography and Nanofabrication
MECH 6347 (EEMF 6382, MSEN 6382) Introduction to MEMS
MECH 6348 (EEMF 6322, MSEN 6322) Semiconductor Processing Technology
MECH 6353 Computational Mechanics
MECH 6354 Experimental Mechanics
MECH 6V49 Special Topics in Manufacturing and Design Innovation

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Mechanics and Materials (MM)
PhD students must take at least four courses from one concentration area.

MECH 6306 Continuum Mechanics
MECH 6350 Advanced Solid Mechanics
MECH 6353 Computational Mechanics
MECH 6354 Experimental Mechanics
MECH 6355 Viscoelasticity
MECH 6367 (MSEN 6310) Mechanical Properties of Materials
MECH 6368 (MSEN 6350) Imperfections in Solids
MECH 6V69 Special Topics in Mechanics and Materials

Thermal and Fluid Sciences (TFS)
PhD students must take at least four courses from one concentration area.

MECH 6370 Incompressible Fluid Mechanics
MECH 6371 Computational Fluid Dynamics
MECH 6372 Turbulent Flows
MECH 6373 Convective Heat Transfer
MECH 6374 Conductive and Radiative Heat Transfer
MECH 6375 Boiling Heat Transfer and Two-Phase Flow
MECH 6377 Advanced Thermodynamics
MECH 6383 (EEMF 6383, PHYS 6383) Plasma Science
MECH 6V89 Special Topics in Thermal and Fluid Sciences

Mathematics Electives: six semester credit hours

MATH 6303 Theory of Complex Functions I
MATH 6313 Numerical Analysis
MATH 6315 Ordinary Differential Equations
MATH 6318 Numerical Analysis of Differential Equations
MATH 6319/MATH 6320 Principles and Techniques in Applied Mathematics I and II
MATH 6308 Inverse Problems and Applications
MATH 6321 Optimization
MATH 6340 Numerical Linear Algebra
MECH 6391 (EEGR 6381) Computational Methods in Engineering
STAT 6331 Statistical Inference I
STAT 6337 Adv. Statistical Methods I and STAT 6338 Adv. Statistical Methods II
STAT 6339 Linear Statistical Models
STAT 6341 Numerical Linear Algebra and Statistical Computing
MATH 7313 Partial Differential Equations I

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Upon the approval of a student's research advisor, a qualified student can request to take other graduate courses in mathematics not listed above.

A Ph.D. student in mechanical engineering must take at least four additional graduate level courses to satisfy their free electives; with the exception of 5000-level courses, which will not count towards the mechanical engineering Ph.D. degree plan. Additionally, no more than two courses offered by the School of Management will be counted towards the Ph.D. degree plan. (This includes the use of MECH 6335, Flexible Manufacturing Strategies.) All electives must be approved by the Ph.D. student's research advisor.

Neither a foreign language nor a minor is required for the Ph.D. However, the student's supervisory committee may impose these or other requirements that it believes are necessary and appropriate to the student's degree program. A qualified student may request waivers on required courses from the student's research advisor and the Mechanical Engineering Graduate Committee. The credit hours for those waived courses must be fulfilled by other courses approved by the student's research advisor and the Mechanical Engineering Graduate Committee.

Important: Students who enter the mechanical engineering doctoral program are not automatically awarded a MS degree upon completing the degree requirements. Students wishing to obtain a master's degree prior to completion of the Ph.D. are required to file the "Addition of Master's degree for Doctoral Students" form by the first day of classes for the semester in which they plan to graduate. In addition, they must submit an approved MS degree plan form to the department office.

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Graduate Transfer Credit Policies

A student who has completed previous graduate coursework comparable to the curriculum of the UT Dallas Graduate Mechanical Engineering program may submit a request to have their coursework considered for transfer credit. Transfer decisions are made in consultation with the dissertation advisor and the graduate committee. Final transfer credit determinations will also be awarded in accordance with the policies and procedures outlined in the Graduate Catalog after a review of official transcripts. Transfer of graduate level credit into a doctoral program in mechanical engineering is limited to a maximum of twenty-seven semester credit hours of graduate coursework.

To qualify for transfer of credit of any class, the grade earned in the course must be a B- or better from an accredited college or university, and the course must not be a correspondence or extension course. In most cases, transfer courses will be substituted for elective credit, lessening the required hours needed for the Ph.D. In some cases, credit may be awarded for a specific course at the discretion of the graduate committee, provided that an official transcript and a syllabus accompany the transfer request. Such decisions are made on a case-by-case basis.

All requests for transfer of credit should be approved by the student's research advisor on the Transfer of Credit Request form, along with an official degree plan, and submitted to the graduate program administrator within the first two semesters of active enrollment in the program; however, acceptance of transfer of credit hours will not occur until after the student has completed nine semester credit hours at UT Dallas with a GPA of at least 3.0. All petitions must be processed and approved no later than the semester prior to the student's anticipated graduation.

Time Limits

All requirements for the doctoral degree must be completed within one ten-year period. Students whose master's degrees are accepted for credit toward a Ph.D. must complete all requirements for the doctoral degree within one eight-year period. Work exceeding these limits, whether done at this university or elsewhere, will not count towards the degree. Exceptions to time limit specifications must be approved by the Dean of Graduate Studies.

Catalog Policy

Provided the requisite courses continue to be offered, students are bound by the coursework requirements of the catalog in force at the time of their admission, within a six-year limit for the completion of the master's degree and ten years for the doctoral degree. This regulation applies to specific coursework and the number of credit hours for the academic degrees set forth in the catalog. All other requirements will change or be continued with the issuance of supplements to the graduate catalog and subsequent revisions to the handbook.

Academic Standing

Registration in the graduate programs beyond the first semester (or summer session) is contingent on the student's being in good academic standing based on three main factors:

- Satisfactory progress in meeting admission conditions that were imposed at the time of admission
- Maintenance of a 3.0 cumulative grade point average
- Satisfactory progress in meeting program degree requirements

If, at the end of a semester, a student's cumulative grade point average is below 3.0, the student will be placed on academic probation. The student must earn sufficient grade points during the next two semesters of registration to raise the cumulative grade point average to at least 3.0 exclusive of incomplete (I) grades. Failure to achieve this 3.0 cumulative grade point average will result in immediate dismissal from the University.

Graduate Grading and Grade Point Average

The following grading scale is used in all Graduate coursework at the University:

GRADE	GRADE POINTS PER SEMESTER HOUR	DESCRIPTION
A	4.00	
A-	3.67	
B+	3.33	
B	3.00	
B-	2.67	
C+	2.33	
C	2.00	
F	0.00	Failure of either a Pass/Fail or Graded Course
I	Incomplete	Grades of I, P, & W do not produce grade points
P	Pass	Grades of I, P, & W do not produce grade points
W	Withdraw	Grades of I, P, & W do not produce grade points

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Doctoral Program Requirements

In addition to course requirements, Ph.D. students are required to complete the following:

- Qualifying Exam (QE): Tests fundamental knowledge in mathematics and one concentration area in mechanical engineering.
- Comprehensive exam (CE): Written dissertation proposal and an exam given by candidate's supervisory committee.
- Final Exam: Completion of a major research project culminating in a dissertation demonstrating an original contribution to scientific knowledge and engineering practice. The dissertation will be defended publicly. The rules for this defense are specified by the Office of the Dean of Graduate Studies.

Typical Timeline for Coursework, Qualifying Exam, and Comprehensive Exam

The ME faculty expect students to make consistent progress toward the PhD degree. The following timeline is expected of doctoral students. In particular, students must schedule the Qualifying Exam and Comprehensive Exam within the timeframe detailed below.

Courses – Depending on the amount of applicable prior Master's coursework, doctoral courses are normally completed in the first two and a half years.

Qualifying Exam – The Qualifying Exam is to be taken within three long semesters from entering the doctoral program. The exam is given twice a year, during the fall and spring semesters.

Comprehensive Exam/Dissertation Proposal – This exam is to be completed within one year after passing the Qualifying Exam.

Milestones Agreement Form

Doctoral study at UTD includes a series of milestones. The key milestones include the completion of required coursework, successfully passing the qualifying examination, preparation and defense of the dissertation proposal (comprehensive examination), and completion and defense of the dissertation. The Milestones Agreement Form defines the specific requirements of the mechanical engineering doctoral program and outlines the expected timeline for degree completion. The student and their research advisor will review and sign this form by the end of the student's first semester in the program and submit it to the Mechanical Engineering Department office. Students who fall behind risk loss of assistantship support or dismissal from the Ph.D. program.

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Ph.D. Milestone Timeline	Sem 1	Sem 2
First Year	○ Complete Core Requirements ○ Research Area Focused ○ Faculty Advisor Selected	
Second Year	○ Qualifying Exam ○ Dissertation Committee Approved ○ Degree Plan Filed	○ Dissertation committee Meeting ○ Draft defense proposal
Third or Fourth Year	○ Final draft of proposal sent to committee ○ Comprehensive Exam completed	
Fifth Year	○ Final draft of Dissertation submitted to committee ○ Dissertation defense successfully completed	

Students are responsible for the vigilant review of the handbook and are strongly encouraged to consult with the Graduate Dean's website regularly to be aware of any changes and to ensure that they comply with all policies as they move toward candidacy.

Qualifying Examination

Students are required to sit for the mechanical engineering qualifying exam within three long semesters after entering the program. (Part-time students are required to sit for the mechanical engineering qualifying exam prior to completing twenty-seven credit hours in the program.) A student must be registered for at least three semester credit hours of graduate coursework during the semester in which he or she wishes to take the qualifying examination. Students on funding may need to take more hours as required by their student appointments and should consult with their research advisor for appropriate classes to take during the semester they plan to complete the exam. A student should verify these minimum requirements and ensure they are in good standing at the university prior to declaring their intent to sit for the examination.

The qualifying exam will test student's knowledge in the following areas:

- Mathematics
- One concentration area in mechanical engineering, chosen by the student and approved by the student's research advisor

The following is a list of the four concentration areas to select from: (1) Dynamic Systems and Controls (DSC); (2) Mechanics and Materials (MM); (3) Thermal and Fluid Sciences (TFS); (4) Manufacturing and Design Innovations (MDI).

The exam takes place over two days. Students are not to bring any outside materials to the exam (no books or notes). On each of these two days, a three-hour written exam is given in one continuous sitting.

The qualifying exam will be offered twice per year, once in the fall and again in the spring. Students are strongly encouraged to meet in advance with their research advisor to help direct their studying and preparation for these examinations.

Students must announce their intent to take the qualifying exam by submitting an "Application for Doctoral Qualifying Exam" form to the Mechanical Engineering Department office within the first three weeks of the semester they intend to sit for the exam.

The questions are chosen by concentration area committees and an ad-hoc math committee. The exam will be graded, and feedback provided to the students by the committee as to the student's individual performance on the examination in all areas after the conclusion of the grading period, which may take several weeks. The committee's composition may change from year to year, with at least one member remaining on for the following year to maintain continuity in the qualifying exam process. Questions may also change from semester to semester.

Grading will be pass/fail. Students in the mechanical engineering program who fail the examination on the first attempt must retake the failed portion(s) within one year, but preferably by the end of the next long semester. Students failing the second examination will not be allowed to pursue a doctoral degree in the program and will be formally dismissed. Per university policy, under no circumstances will a third examination be allowed. Students who are funded with assistantships may, at the discretion of the program head and associate department head, lose their funding if they fail any area of the first exam. Funding may be reinstated following successful completion of the retake.

Qualifying Exam Timeline
(long semesters, spring/fall)

Weeks 2-3	Application due with identification of chosen concentration area
Week 11	Written exams (March/November)
Week 13	Announcement of QE results

Doctoral Candidacy and Dissertation

Doctoral Candidacy

Students will enter into doctoral candidacy upon successful completion of the Qualifying Examination, maintaining the GPA requirements in Ph.D. level organized courses, and the assignment of an approved supervising committee through the submission of the Committee Appointment Form signed by all members.

Supervising Committee

The supervising committee will oversee and assist the student in developing a dissertation proposal, conducting research related to the dissertation, and reviewing and evaluating the written dissertation and oral defense. Students should form a supervising committee by the beginning of their third semester. The supervising committee consists of four UTD faculty members with one of the four designated as the Chair. Additional faculty from inside or outside the university may be selected; however, no more than one external member will be approved. At least half of the committee members must be mechanical engineering faculty (or affiliate faculty members). The composition of the supervising committee must follow the guidelines contained in the UT Dallas policy memorandum, "Policy on Procedures for Completing a Graduate Degree," which is located on the Graduate Studies website.

When the committee has been formed, the student submits the Committee Appointment Form signed by the proposed members of the committee to the Mechanical Engineering Graduate Program Administrator. Approval has to be first made by the Graduate Studies Committee in the department office. Final approval of the supervising committee is made by the UT Dallas Dean of Graduate Studies.

To ensure that the supervising committee continues to play a role in contributing to the research, a meeting of the dissertation committee must occur at least once annually. The University requires an annual meeting and report.

Comprehensive Exam/Dissertation Proposal

The comprehensive exam consists of completing an oral exam given by the candidate's supervising committee, and submitting a written dissertation proposal to the supervising committee at least two weeks before the oral exam.

When the committee Chair is satisfied with the proposal and believes the student is ready to be formally evaluated, the student will present their dissertation proposal to the supervising committee. The presentation is followed by an oral exam consisting of questions from the general audience in open session, and from the supervising committee in a closed session. The supervising committee will determine whether the student is adequately prepared and has the ability to conduct independent research and sign the Comprehensive Examination Report

form. The student will submit this form to the Mechanical Engineering Graduate Program Administrator.

Students who fail the first oral defense of their dissertation proposal must re-defend before the end of the following semester. Students who fail the oral defense of their dissertation proposal a second time or who fail to hold the defense prior to the end of the following semester will be dismissed from the program. A student must pass the comprehensive exam at least one semester before the Final Exam.

Final Exam/Doctoral Dissertation
Each doctoral candidate must prepare and submit a major research project culminating in a dissertation demonstrating an original contribution to scientific knowledge and engineering practice. The rules for this defense are specified by the Office of the Dean of Graduate Studies in the “Guide for the Preparation of Master’s Theses and Doctoral Dissertations.” The dissertation will be defended publicly.

The presentation and defense of the Dissertation will constitute the Final Oral Examination for the doctoral candidate. Specifics on the scheduling and conduct of the examination are contained in the "Guide for the Preparation of Master’s Theses and Doctoral Dissertations." The student must file the Request for Dissertation Defense form with the Office of Graduate Studies two weeks prior to the defense. A copy of the dissertation must be given to each committee member two weeks in advance of the exam. This copy should be in a form so that it could be turned in as the final version. It should not be left for the committee to make major corrections and revisions in spelling, syntax, organization, or content of dissertation. The initial phase of the examination will be open to the public. Following the public presentation, the candidate will be examined by the members of the examining committee. This part of the examination is not open to the public. The examination will focus primarily on the candidate’s research contribution, although aspects of the general field in which the candidate’s research was conducted may also be covered.

One of five possible results of the examination will be reported: (1) passed the oral examination and manuscript accepted, (2) passed the oral examination and manuscript accepted pending specified revisions, (3) second oral examination required, but manuscript accepted or accepted with specified revisions, (4) major revisions of the manuscript and a second oral examination required, or (5) oral examination failed, manuscript not accepted and the committee recommends dismissal from the program.

If a recommendation for re-examination is made, the second Final Oral Examination must be taken between six months and one year after the first examination. In no cases will a third Final Oral Examination be given.

Important: If a doctoral student is entering into his/her last semester, will orally defend the Dissertation, anticipates having all final materials submitted to the graduate school by the deadline for binding, and plans to graduate that semester, the student may enroll in as little as one credit hour. If for some reason the student does not pass the final oral exam or has too much to correct in the final piece by the deadline, he or she may not use the one hour rule a second time and must enroll in three hours the following semester in order to finish. This is applicable to all doctoral students.

Career Advising

Career advising and job search resources are available to mechanical engineering students through the UT Dallas Career Center. The Engineering and Computer Science Career Consultant can provide assistance with interview preparations, resume writing, and tools for conducting an effective job search. Students are encouraged to schedule an appointment with the ECS Career Consultant before graduating. (http://www.utdallas.edu/career/)

Graduation

In the semester a student intends to graduate, there are several important deadlines they must meet and fees that are to be paid. Students should check the Office of Graduate Study's website (http://www.utdallas.edu/dept/graddean/) and the University Registrar's website (http://www.utdallas.edu/student/registrar/graduation/) for these deadlines and fees.

The graduate student has the responsibility to notify the graduate program administrator in the mechanical engineering department office of their intent to graduate at least one semester prior to their expected graduation to ensure that they have met all departmental and university requirements.

Application for graduation is now handled online. The student must apply for graduation by the posted deadline through their Galaxy account. Failure to apply for graduation by the posted deadline in a given semester will make the candidate ineligible for graduation in that semester.

APPENDICES

A. Mechanical Engineering Faculty

B. Milestones Agreement Form

C. Mechanical Engineering PhD Degree Plan

D. PhD Transfer of Credit Request Form

E. Committee Appointment Form

F. Qualifying Examination Study List

G. Qualifying Examination Application

H. Comprehensive Examination Checklist

I. Request for Comprehensive Examination

J. Comprehensive Examination Report

K. Request for Final Oral Examination

L. Final Oral Examination Report

M. Graduation Checklist

APPENDIX A

Mechanical Engineering Faculty

Mechanical Engineering Faculty

Anderson, William *Fluid Mechanics & Turbulent Flows*	Assistant Professor	william.anderson@utdallas.edu 972-883-4618
Ashuri, Turaj *Wind & Wave Energy, Multidisciplinary Design Optimization, & Fluid-Structure Interaction*	Visiting Assistant Professor	turaj.ashuri@utdallas.edu 972-883-4442
Baughn, Terry *Solid Mechanics & Design*	Senior Lecturer	tvbaughn@utdallas.edu 972-883-3584
Choi, Wonjae *Interfacial Fluid Mechanics*	Assistant Professor	wonjae.choi@utdallas.edu 972-883-6625
Gregg, Robert D *Rehabilitation Robotics*	Assistant Professor	rgregg@utdallas.edu 972-883-4657
Hart, Robert *Fluid Mechanics, Thermal Science, & Engineering Education*	Senior Lecturer	robert.hart@utdallas.edu 972-883-4225
Hassanipour, Fatemeh *Heat Transfer & Fluid Mechanics*	Assistant Professor	fatemeh@utdallas.edu 972-883-2914
Hilkert, James *Control Systems*	Senior Lecturer	hilkert@utdallas.edu 972-883-4681
Iungo, G. Valerio *Fluid Mechanics*	Assistant Professor	valerio.iungo@utdallas.edu 972-883-4621
Leonardi, Stefano *Computational Fluid Mechanics, Wind Energy, & Super Hydrophobic Surfaces*	Associate Professor	stefano.leonardi@utdallas.edu 972-883-3564
Li, Yaoyu *Energy Systems & Mechatronics*	Associate Professor	yaoyu.li@utdallas.edu 972-883-4698
Lu, Hongbing *Solid & Nano Mechanics*	Professor; Louis A. Beecherl Jr. Chair; Associate Department Head	hongbing.lu@utdallas.edu 972-883-4647
Malik, Arif *Computational Structural Mechanics, Uncertainty, Reliability-Based Design*	Associate Professor	arif.malik@utdallas.edu 972-883-4550
Majewicz, Ann *Medical & Surgical Robotics*	Assistant Professor	972-883-4660
Minary, Majid *Nanobiomechanics & Scanning Probe Microscopy*	Assistant Professor	majid.minary@utdallas.edu 972-883-4641

Moheimani, Reza *Control Systems, Mechatronics, Nanotechnology*	Professor; James Von Erh Distinguished Chair	reza.moheimani@utdallas.edu 972-883-4158
Park, Wooram *Robotics & Image Processing*	Assistant Professor	wooram.park@utdallas.edu 972-883-4625
Qian, Dong *Computational Solid Mechanics & Material Science*	Professor	dong.qian@utdallas.edu 972-883-4890
Qin, Zhenpeng *Biotransport, Nanotechnology, Thermo-Plasmonics, Point-of-Care Diagnostics, & Biosensors*	Assistant Professor	zhenpeng.qin@utdallas.edu 972-883-4440
Rios, Oziel *Robotics, CAD, & Design*	Senior Lecturer II	oziel.rios@utdallas.edu 972-883-4690
Rotea, Mario *Control Systems*	Professor; Erik Jonsson Chair; Department Head	rotea@utdallas.edu 972-883-2720
Summers, Tyler *Control and optimization in dynamical networks, power and energy networks, distributed robotics*	Assistant Professor	tyler.summers@utdallas.edu 972-883-4554
Tadesse, Yonas *Humanoids, Smart Materials & Systems & Mechatronics*	Assistant Professor	yonas.tadesse@utdallas.edu 972-883-4556
Thamban, P. L. Stephan *Materials Processing & Process Control Diagnostics in Semiconductor Manufacturing*	Senior Lecturer	stephan@utdallas.edu 972-883-4687
Voit, Walter *Shape Memory Polymers*	Assistant Professor	walter.voit@utdallas.edu 972-883-5788
You, S.M. *Heat Transfer & Thermal Science*	Professor; Associate Department Head	you@utdallas.edu 972-883-4619
Zhang, Jie *Multidisciplinary Design Optimization, Power and Energy Systems, & Renewable Energy*	Assistant Professor	jiezhang@utdallas.edu 972-883-4541

Mechanical Engineering Affiliated Faculty

Blanchard, Andy	Professor; Vice Provost	ablanch@utdallas.edu 972-883-2273
Burnham, Gerry	Associate Professor	burnham@utdallas.edu 972-883-2977
Chabal, Yves	Department Head, Professor, MSE; TI Distinguished Chair	chabal@utdallas.edu 972-883-5751
Cho, Kyeongjae (KJ)	Professor	kjcho@utdallas.edu 972-883-2845
Fahimi, Babak	Professor	fahimi@utdallas.edu 972-883-6609
Goeckner, Matthew	Professor	goeckner@utdallas.edu 972-883-4293
Gnade, Bruce	Professor; Vice President for Research; Distinguished Chair in Microelectronics	gnade@utdallas.edu 972-883-6636
Hu, Wenchuang (Walter)	Associate Professor	walter.hu@utdallas.edu 972-883-6329
Hunt, Bob	Professor Emeritus	hunt@utdallas.edu 972-883-2191
Kim, Jiyoung	Associate Professor	jiyoung.kim@utdallas.edu 972-883-6412
Kim, Moon	Professor	moonkim@utdallas.edu 972-883-6635
Lee, Jeong-Bong (JB)	Professor	jblee@utdallas.edu 972-883-2893
Rajashekara, Kaushik	Distinguished Professor, Distinguished Chair of Engineering	k.raja@utdallas.edu 972-883-4531
Spong, Mark	Professor; Dean; Lars Magnus Ericsson Chair in Electrical Engineering and Excellence in Education Chair	mspong@utdallas.edu 972-883-2974
Vidyasagar, Mathukumalli	Professor; Cecil H. and Ida Green Chair in Systems Biology Science	m.vidyasagar@utdallas.edu 972-883-4679
Wallace, Robert M.	Professor, Erik Jonsson Distinguished Chair	rmwallace@utdallas.edu 972-883-6638
Yurkovich, Steve	Professor; Louis Beecherl, Jr. Distinguished Chair Program Head, Systems Engineering	steve.yurkovich@utdallas.edu 972-883-2305

APPENDIX B

Milestones Agreement Form

Milestones Agreement Form

Mechanical Engineering

Student Name:

This form is provided for the purpose of informing students about the academic milestones that they will be expected to reach in order to earn their PhD (*or AUD*) degree as well as when they are expected to complete these milestones. Students are expected to reach each milestone within the specified time period in order to make satisfactory progress through the program. Students who are not making satisfactory progress may lose funding, be placed on academic probation, or be dismissed from the program.

Academic Advising

Upon entering the Mechanical Engineering program, each student must be accepted by a faculty advisor within one long semester. The advisor will be a member of the program department. In the event that a student must change faculty advisors, the student will be given no more than one semester to locate a new faculty advisor before being dismissed from the program.

- The advisor will provide the student with guidance and mentoring and will seek the assistance of other faculty and graduate school resources when necessary to support the student's academic and career development.
- The advisor will ensure that a mutually agreed upon set of expectations and goals for the student are in place and assessed periodically.
- The advisor will help the student assemble a thesis/dissertation committee.
- The advisor will provide career advice and links to information on previous graduate placement.
- The advisor will be accessible to give advice and feedback on career goals.

Academic advising includes the following elements that are designed to ensure that students remain in good academic standing and make satisfactory progress through the program:

- Annual reviews between student and advisor. The results of this review will be included in the program's annual doctoral progress report.
- Suggestions on course selection
- Review of Degree Plan to determine if modifications are necessary
- Clarification of the timetable for completing any remaining course requirements, examinations, and other requirements
- Assistance in understanding the requirements for successful completion of dissertation

Requirements for all Students in the ME Program

Milestone	Expected Time of Achievement
Review of Student's Progress with (advisor, Doctoral studies committee)	Annually
Successful completion of oral and/or written qualifying exam	Within 3 long semesters if the student already has an MSME degree, or 4 otherwise
Relevant Coursework Successfully Completed	99SCH
Dissertation Committee Appointed and Approved	Within 50SCH
Research Protocols and/or IRB Approval (as applicable)	99SCH
Dissertation Proposal Completed and Approved	99SCH
Dissertation Completed and Approved by Committee	99SCH
Dissertation Accepted by Graduate School	99SCH
Exit Interview Completed and Submitted To SED	99SCH

Status/Progress of student's research for fall – spring 2016 semesters:

___*Progress is satisfactory in all aspects*
___*Quality of work is generally satisfactory, but student is falling behind the expected schedule; more effort is indicated*
___*Progress is on schedule but quality of work needs to be improved to ensure an acceptable final product*
___*Work is sufficiently behind schedule that finishing within the support or time limits is unlikely*
___*Quality of work is below that expected for the degree; a large change is necessary in either the effort and result being obtained or in the degree being attempted*
___ *Student is committed but appears to not have the capacity to complete the degree and should be counseled to change majors or to withdraw*
___ *Other/additional comments*_____

_____

Degree Completion Checklist for Students

- Maintain active student status by registering for courses every fall and spring semester (*may also include summer depending on program-specific requirements)*
- Submit your signed *Milestones Agreement Form* to your advisor before the end of your first year
- Complete all required organized coursework
- Schedule and successfully complete required qualifying exams
- Select the Chair and members of your dissertation committee
- Prepare and successfully present your dissertation proposal
- Apply for Advancement to Candidacy
- Enroll in required dissertation hours and complete your dissertation
- Successfully complete your defense of your dissertation
- Submit required documentation to the Graduate School for completion and graduation

Number of remaining organized courses required for degree completion:_____
How many doctoral hours will student have accumulated by the end of this semester _____
Currently how is the student supported? TA ☐ RA ☐ Self-supported ☐

I have read this form and have had the opportunity to discuss the information contained in it with my advisor. I understand the academic milestones that I am expected to reach in order to successfully complete the ME program, as well as the expected timeline for completing these milestones.

Committee Members:

_____
Supervising Professor (Print or type)

_____

_____

_____

_____

_____ _____
Print Student Name UTD ID #

_____ _____
Student's Signature Date

_____
Print Advisor Name

_____ _____
Advisor's Signature Date

APPENDIX C

Mechanical Engineering PhD Degree Plan

Mechanical Engineering
Ph.D. Approved Degree Plan

Name _____ UTD ID _____

Complete one core course from each of the four groups below **Must earn "B-" or better**:

Dynamic Systems and Control (select <u>one</u>)

Course Number	Course Title	Semester	Transfer?	Approval	Grade
MECH 6300	Linear Systems				
MECH 6314	Engineering Systems: Modeling & Simulation				

Manufacturing & Design Innovation (select <u>one</u>)

Course Number	Course Title	Semester	Transfer?	Approval	Grade
MECH 6303	Computer Aided Design				

Mechanics & Materials (select <u>one</u>)

Course Number	Course Title	Semester	Transfer?	Approval	Grade
MECH 6306	Continuum Mechanics				
MECH 6350	Advanced Solid Mechanics				

Thermal & Fluid Sciences (select <u>one</u>)

Course Number	Course Title	Semester	Transfer?	Approval	Grade
MECH 6370	Incompressible Fluid Mechanics				
MECH 6373	Convective Heat Transfer				
MECH 6374	Conductive Heat Transfer				

Complete at least 4 courses from the list of prescribed electives in chosen concentration area (12 hrs) Area:

Course Number	Course Title	Semester	Transfer?	Approval	Grade

Complete 2 courses from the list below to satisfy the mathematics elective requirement (6 hrs)

Course Number	Course Title	Semester	Transfer?	Approval	Grade
MATH 6303	Theory of Complex Functions				
MATH 6313	Numerical Analysis				
MATH 6315	Ordinary Differential Equations				
MATH 6318	Numerical Analysis of Diff. Equations				
MATH 6319-20	Principles & Techniques in Appl. Math I & II				
MATH 6308	Inverse Problems & their Applications				
MATH 6321	Optimization				
MATH 6340	Numerical Linear Algebra				
MECH 6391	Computational Methods				
STAT 6331	Statistical Inference I				
STAT 6337-8	Statistical Methods I, II				
STAT 6339	Linear Statistical Methods				
STAT 6341	Numerical Linear Algebra & Stat Computing				
MATH 7313	Partial Differential Equations I				

*** Upon approval from research advisor, a student can request to take other mathematics courses not listed above.*

Approved Electives (48 hrs)

Course Number	Course Title	Semester	Transfer?	Approval	Grade
MECH 8v70	Research (30 hrs)				
MECH 8v99	Dissertation (6 hrs)				

Total SCH _____ (min.78)

Approvals	Signature	Date
Student		
Faculty Advisor		
Assoc. Dept. Head		

APPENDIX D

PhD Transfer of Credit Request Form

Ph.D. TRANSFER OF CREDIT REQUEST

All transfer requests should be submitted within the first two semesters of enrollment and must be completed before the semester in which the student plans to graduate. The Department of Mechanical Engineering holds the student responsible for attaching all copies of course descriptions, syllabi, and transcripts to the transfer request and for providing official transcripts to the Office of Student Records.

Name (please type or print) _____ **Student UTD ID** _____

Transfer credits to be applied to _____ **degree at UTD.**

Degree sought (circle one): MS PhD Other_____ **Concentration**_____

For a course to be transferred, the student must have completed an equivalent graduate level course at another accredited university with a grade of B or better. UTD does not award transfer credit for experiential learning, performance or work experience. Transfer course grades will not be averaged into your overall UTD GPA.
Applicable coursework cannot be more than 6 years old. No exceptions to any transfer of credit policy shown in the Graduate Catalog will be considered.

Course the student in submitting to replace the UTD course:

UTD Course #	UTD Course Title	T-Course #	T-Course Title	Institution	Grade	Date Taken

To the Graduate Committee:
The applicant's file has been reviewed and the Dissertation Advisor's signature below certifies that the transfer credits requested are a solid basis for graduate work in our UTD program. Either the original transcript or copy of same and coursework description/syllabi are attached.

(Circle)
APPROVED DENIED Need more information _____

(If Applicable) APPROVED- VALID UNTIL (DATE): _____

_____ _____
Dissertation Advisor **Date**

_____ _____
Mechanical Engineering Assoc. Department Head **Date**

CHECKLIST FOR TRANSFER OF COURSES INTO MECHANICAL ENGINEERING PhD PROGRAM:

(Check each item if it meets the approved criteria)

___ Check to be sure no more than 27 hours TOTAL have been transferred

___ Check to be sure course number is equivalent to a 6000 level course or above (cannot be an undergraduate number even if undergraduate number is approved at previously attended university for graduate credit)

___ Course was taken within 6 year time limit

___ Grade received in course was "B" or better ("P" or "Pass" grade must be equivalent to "B")

___ Request must be submitted along with a degree plan, signed by the dissertation advisor

___ Copy of official transcript attached (only if course was completed after you applied to UTD) with course and grade marked (B or above)

___ Catalog description and/or official course outline (accredited United States universities)

___ If no catalog description is available (foreign universities only): provide an official course description signed by a university official ranking as a department chair or higher and sent directly to the UTD Mechanical Engineering Department. Also provide the name of the university official and contact information including university email address, telephone number, and fax number.

_____A URL may also be given if the material may be currently accessed from the Internet using the given URL.

Notice: Information provided by students for reason of obtaining waivers or transfers is considered as true and accurate. If such information is found to be falsified or inaccurate, it may be grounds for cancellation of enrollment and/or disciplinary action.

Transfer credit will not be applied to a degree plan until 9 credit hours have been successfully completed at UTD.

APPENDIX E

Committee Appointment Form

COMMITTEE APPOINTMENT
GRADUATE PROGRAM

Doctoral degree_____ **Master's degree_____**

_____ **ID#_____**
Student

Requests the formal appointment of the following members to serve as his/her supervisory committee:

_____ _____
Supervising Professor please print signature

_____ _____
Co-Chair (if applicable) please print signature

_____ _____
Committee Member please print signature

_____ _____
Committee Member please print signature

_____ _____
Committee Member please print signature

_____ _____
Committee Member please print signature

APPROVAL

_____ _____
Department Head signature date

_____ _____
Dean of Graduate Studies signature date

APPENDIX F

Qualifying Examination Study List

Mechanical Engineering Ph.D. Qualifying Exam

A Ph.D. student entering the Ph.D. program in Mechanical Engineering must take the qualifying exam within three long semesters. The purpose of the qualifying exam is to determine the student's potential for success in the Ph.D. program. The qualifying exam will test **Mathematics** and **one concentration area** in mechanical engineering, and will be given in fall and spring semesters. The qualifying exam consists of a three-hour written exam to test mathematics and another three-hour written exam to test one concentration area approved by the student's dissertation advisor. A student who fails in the first attempt in qualifying exam has a second chance to take the qualifying exam in mathematics and/or the concentration area in which the student fails in the first attempt in the immediately following long semester. A Ph.D. student is required to submit a qualifying exam application form within the first three weeks of the semester when the exam is taken. The following is a list of topics and references in Mathematics, and the four concentration areas: (1) Dynamic Systems and Controls (DSC); (2) Mechanics and Materials (MM); (3) Thermal and Fluid Sciences (TFS); and (4) Manufacturing and Design Innovations (MDI).

Mathematics

***Linear Algebra*:** Systems of linear equations, determinants, vectors and vector spaces, linear transformations, eigenvalues and eigenvectors, quadratic forms. ***Calculus*:** Complex numbers, multivariable calculus and analytic geometry. Study of polar, cylindrical, and spherical coordinates, vector differential calculus, vector integral calculus, and vector integral theorems. ***Ordinary Differential Equations*:** First order differential equations, system of linear differential equations, stability, series solutions, special functions, Fourier and Laplace transforms. ***Partial Differential Equations*:** Analytical methods for the solution of boundary value problems governed by partial differential equations.

References:

- Ermin Kreyszig, *Advanced Engineering Mathematics*, Wiley, 10th edition, 2011.
- Howard Anton, *Elementary Linear Algebra*, Wiley, 10th Edition, 2010.
- William E. Boyce and Richard C. DiPrima, *Elementary Differential Equations & Boundary Value Problem,* Wiley, 10th edition, 2013.

Concentration Area: Dynamic Systems and Controls (DSC)

Systems and Controls*:** Newtonian dynamics. Modeling of dynamic systems for either electromechanical systems or thermo-fluid systems. transfer functions and block diagrams, time and frequency response of dynamic systems to input commands, disturbances and noises, poles and zeros, PID and other dynamic controller functions, root locus method for controller design and stability analysis, Bode plots for stability analysis and controller design, Nyquist plot and stability. ***Linear systems: Eigenvalues/eigenvectors, state-space representations, solutions, and realizations, controllability, observability, BIBO and Lyapunov stability, state feedback controllers and state estimators.

References:

- Richard C. Dorf and Robert H. Bishop, *Modern Control Systems,* 12th Edition, 2010.
- Gene F. Franklin, J. David Powell, Abbas Emami-Naeini, *Feedback Control of Dynamic Systems*, 6th Edition, 2009.
- Chi-Tsong Chen, *Linear System Theory and Design*, 4th Edition, 2012.
- Russell C. Hibbeler. Engineering Mechanics: Dynamics, 13th Edition Prentice Hall, 2013.

Concentration Area: Mechanics and Materials (MM)

***Intermediate Mechanics of Materials*:** Principal stresses, failure theories (various failure criteria, fracture mechanics concepts, fatigue), symmetric and unsymmetric beam bending, torsion and shear of thin-walled sections, combined loading, energy methods (unit load method, Castigliano's theorems), two-dimensional elasticity (stress and displacement methods, boundary conditions, Airy's stress function), torsion theories (St. Venant torsion theory, Prandtl method), and column buckling. ***Continuum Mechanics*:** Tensor analysis, analysis of deformation, analysis of stress, constitutive equations, material anisotropy, mechanical properties of fluids and solids, derivation of field equations, boundary conditions, and solutions of initial and boundary value problems for continua.

References:

- R. D. Cook and W. C. Young, *Advanced Mechanics of Materials*, 2nd edition, Prentice-Hall, Upper Saddle River, NJ, 1999.
- W. M. Lai, D. Rubin and E. Krempl, *Introduction to Continuum Mechanics*, 4th edition, Butterworth–Heinemann, 2009.
- A. C. Ugural and S. K. Fenster., *Advanced Strength and Applied Elasticity*, 5th edition, Prentice Hall, 2012.

Concentration Area: Thermal and Fluid Sciences (TFS)

***Fluid Mechanics*:** The students should be able to apply (i) fundamental equations and dimensionless analysis to incompressible fluid mechanics problems, (ii) formulate and apply the concept of laminar boundary layer and the linear stability of laminar flows, (iii) analyze the transition from laminar to turbulent flow, (iv) formulate and apply the concept of turbulent boundary layers (iv) derive the Reynolds equations and turbulence models. The test may include problems both in the laminar regime (Poiseuille, Couette, or wind driven flows) as well as in the turbulent regime (jets, wakes, mixing layers). ***Heat Transfer*:** Successful demonstration of advanced-level knowledge of the macroscopic view and foundation of the three modes of heat transfer (conduction, convection and thermal radiation) is required. In addition, candidates must demonstrate the ability to conceptualize thermal systems and processes involving thermal transport phenomena. All topics in the reference can be covered excluding phase-change heat transfer (condensation, evaporation, and boiling).

References:

- F. White, *Viscous Fluid Flow*, 3rd edition, McGraw-Hill, 2005
- A. F. Mills, *Heat Transfer*, 2nd edition, Prentice Hal, 1998.

Concentration Area: Manufacturing and Design Innovations (MDI)

Component design*:** Engineering materials, load and stress analysis, deflection and stiffness, failure due to static loading, fatigue failure due to variable loading, cumulative damage analysis, statistical analysis in design against failure, design of shafts, bearing, gears, and joints. ***Kinematic and Dynamics of Machinery: Kinematic analysis of planar mechanisms (position, velocity, acceleration), statics and dynamics of planar mechanisms, analysis and design of cams and gears. ***Computer Aided Design*:** Parametric representation of curves including Hermite cubic splines, Bezier curves and synthetic polynomial curves and non-parametric representation of curves, surface representation in CAD (synthetic: Splines and Bezier, and analytic: plane, ruled, revolution, tabulated), classification of solid models (2 ½ D, 3D and a combination 2 ½ and 3D), solid modeling approaches (half space operations, boundary representation (B-rep), constructive solid geometry (CSG), feature based), engineering drawings including classification and dimensioning of part views, assembly modeling (assembly tree, mating , top-down, bottom- up approaches).

References:

- Nisbett and Budynas, *Shigley's Mechanical Engineering Design*, 9th edition, McGraw-Hill, 2010.
- Ibrahim Zeid, *Mastering CAD/CAM*, McGraw-Hill, 2005.
- John J. Uicker, Gordon R. Pennock and Joseph E. Shigley, *Theory of Machines and Mechanisms*, 4th Edition, Oxford University Press, 2010.

APPENDIX G

Qualifying Examination Application

Department of Mechanical Engineering
Erik Jonsson School of Engineering and Computer Science
University of Texas at Dallas

Graduate Program in Mechanical Engineering
Application for the Doctoral Qualifying Examination

Doctoral students who intend to take the Ph.D. Qualifying Examination (QE) must submit this application within the first three weeks of a semester. The student must be registered in at least 3 hours for the semester in which the QE is to be taken and be in good academic standing. Submit the completed form to the Mechanical Engineering department office.

Name: _____ Student ID #: _____

E-Mail: _____ Telephone #: _____

Ph.D. Advisor Signature: _____ Date: _____

Concentration Areas (select 1): ☐ Dynamic Systems & Controls ☐ Manufacturing & Design Innovation
☐ Mechanics & Materials ☐ Thermal & Fluid Sciences

Graduate Educational Background:

Degree	Year	GPA	University

List organized graduate level courses you have completed at UTD or any other graduate institution:

Course Name & Institution	Sem./Year	Grade

Current schedule:

Course Sub. & Num.	Course Title	Days & Time

For ME Graduate Office use only: Registration status:_____ Graduate Course GPA: _____

Approved by: _____ Date:_____

APPENDIX H

Comprehensive Examination Checklist

THE UNIVERSITY OF TEXAS AT DALLAS
GRADUATE PROGRAM IN MECHANICAL ENGINEERING
COMPREHENSIVE EXAMINATION CHECKLIST

Steps to follow for the Comprehensive Examination/Dissertation Proposal:

- Submit Committee Appointment Form for approval by the Mechanical Engineering Department and Graduate Dean
    - Follow guidelines for supervisory committee in the PhD Student Handbook

- After supervisory committee has been approved, meet with all members to discuss the current status of your research

- Prepare a written dissertation proposal with the guidance of your committee Chair

- When complete, provide a copy of your written dissertation proposal to each member of your committee and schedule a date for your oral exam (these must be at least 2 weeks apart)

- Submit Request for Examination Form signed by all members of your committee to Mechanical Engineering Graduate Program Administrator

- Present dissertation proposal to supervisory committee and complete oral exam

- Submit signed Comprehensive Examination Report to Mechanical Engineering Graduate Program Administrator

The Comprehensive Examination must be completed at least one semester before the Final Exam/Dissertation Defense.

APPENDIX I

Request for Comprehensive Examination

THE UNIVERSITY OF TEXAS AT DALLAS
GRADUATE PROGRAM IN MECHANICAL ENGINEERING
REQUEST FOR COMPREHENSIVE EXAMINATION

This request must be submitted to the Mechanical Engineering Department two weeks before the proposed examination date. The Comprehensive Examination must be completed at least one semester before the Final Examination.

This is to report that _____ , ID _____ a candidate
(Student Name) (UTD ID)

for the doctoral degree in Mechanical Engineering, has completed all or most of the formal coursework as required by the Graduate Program and to request an oral comprehensive examination on _____ at _____ in
(Month/Day/Year) (Time)

_____.
(Building, Room Number)

Signatures of the Supervisory Committee:

COMMITTEE CHAIR (please print)	SIGNATURE	DATE
COMMITTEE MEMBER	SIGNATURE	DATE
COMMITTEE MEMBER	SIGNATURE	DATE
COMMITTEE MEMBER	SIGNATURE	DATE
COMMITTEE MEMBER	SIGNATURE	DATE

APPENDIX J

Comprehensive Examination Report

THE UNIVERSITY OF TEXAS AT DALLAS
GRADUATE PROGRAM IN MECHANICAL ENGINEERING
COMPREHENSIVE EXAMINATION REPORT

We, the undersigned, as the Supervisory Committee for the doctoral dissertation of

(STUDENT NAME)_____

(STUDENT ID)_____

Report that he/she has presented his/her proposal and we have conducted the oral examination.

_____
EXAMINATION DATE

The student has:

1. Completed the work assigned by the Supervisory Committee.
2. Passed all examinations required by the Graduate Program in Mechanical Engineering.
3. Satisfied any other Program or School candidacy requirements.

Therefore, we are presenting him/her for doctoral candidacy at this time.

Comments/Conditions:

_____

_____

_____

_____

Signatures of the Supervisory Committee:

COMMITTEE CHAIR (PRINT)	SIGNATURE	DATE
COMMITTEE MEMBER	SIGNATURE	DATE
COMMITTEE MEMBER	SIGNATURE	DATE
COMMITTEE MEMBER	SIGNATURE	DATE
COMMITTEE MEMBER	SIGNATURE	DATE

APPENDIX K

Request for Final Oral Examination

Please check with your Supervising Professor to make sure your reserved room is acceptable before submitting this form.

THIS FORM MUST BE TYPED

REQUEST FOR FINAL ORAL EXAMINATION

This form must be submitted to the Office of Graduate Studies two weeks prior to date of examination. It must be accompanied by a copy of this form, 2 hard copies of the dissertation (1 in a 3-ring binder, 1 in a folder), and 1 CD with the PDF file of the dissertation.

DEPARTMENT: _____

THIS IS TO REPORT THAT THE SUPERVISING COMMITTEE FOR:

_____

(Name of the Doctoral Candidate)

has received the doctoral dissertation for the purpose of examination and now requests that the final oral examination be set for:

_____

(Month) (Day) (Year) (Time) (Place)

DOCTORAL CANDIDATE'S E-MAIL ADDRESS_____

TITLE OF DISSERTATION:_____

_____

_____

By his/her signature below each member of the Supervisory Committee agrees that he/she considers the dissertation and dissertation abstract to be in satisfactory form for the purpose of final examination, that he/she is agreeable to proceeding with the final examination, and that he/she is willing to attend this examination on the date specified.

COMMITTEE APPROVALS:

_____ _____

Supervising Professor (Print Name) Signature

_____ _____

Print Name **Signature**

_____ _____

_____ _____

_____ _____

_____

NAME (ONE MEMBER OF MY COMMITTEE WILL BE ABSENT FROM THE EXAM)

COMMENTS:_____

_____

_____

APPROVED:_____

Dean of Graduate Studies

Last Updated: March 2013

APPENDIX L

Final Oral Examination Report

THE UNIVERSITY OF TEXAS AT DALLAS
GRADUATE PROGRAM IN MECHANICAL ENGINEERING
REPORT OF DOCTORAL FINAL ORAL EXAMINATION

We, the undersigned, as the Supervisory Committee for the doctoral dissertation of

(DOCTORAL CANDIDATE) _____

(UTD ID) _____

report that he/she has defended his/her dissertation and we have conducted the final oral examination.

_____
EXAMINATION DATE

The student has:

1. Completed the work assigned by the Supervisory Committee.

2. Passed all examinations required by the Graduate Program in Mechanical Engineering.

3. Completed a dissertation which gives evidence of his/her ability to do independent research and itself constitutes a contribution to knowledge.

4. We recommend that he/she be granted the degree of Doctor of Philosophy in Mechanical Engineering.

Conditions (if any) _____

_____

_____	_____
COMMITTEE CHAIR (PRINT)	(SIGNATURE)
_____	_____
MEMBER (PRINT)	(SIGNATURE)
_____	_____
MEMBER (PRINT)	(SIGNATURE)
_____	_____
MEMBER (PRINT)	(SIGNATURE)
_____	_____
MEMBER (PRINT)	(SIGNATURE)

cc: Committee Chair
Student

APPENDIX M

Graduation Checklist

GRADUATION CHECKLIST

All students:

1. ___ Check with your program to ensure that all necessary coursework to graduate has been completed.
2. ___ Enroll in a graduate level course at UTD. Doctoral students must be registered in three hours in the semester they defend. If applicable, complete in absentia form (see your department).
3. ___ Make certain to complete all incomplete grades. Check with your program office to be certain any necessary grade change forms have been received by the Records Office.
4. ___ Pay all necessary fees in the Records or Bursar's Office.
5. ___ Check with your program for any holds that may be on your student account.
6. ___ Fill out the Application for Graduation online through Galaxy by the deadline.
7. ___ After you apply to graduate, you need to check your UT Dallas email on a regular basis. You will receive all correspondence regarding your graduation and commencement there.
8. ___ Notify the graduate program administrator in your department of any schedule changes, as it may affect your graduation.
9. ___ Make sure that the UTD Records Office has your most current mailing address to ensure that your diploma is sent to the correct location.

Doctoral Candidates:

1. ___ Review the "Guide for the Preparation of Master's Theses & Doctoral Dissertations" from the Graduate Dean's website: www.utdallas.edu/dept/graddean/dgindex.htm. Prepare your document in accordance with these guidelines.
2. ___ When your supervising professor declares you ready to defend your dissertation, distribute dissertation copies to all committee members. Most departments require at least two weeks to review it.
3. ___ When all committee members agree that you are ready to defend, obtain a "Request for Final Oral Examination" form from your program/department office.
4. ___ Bring completed "Request for Final Oral Examination" form, signed by every committee member, and one additional copy of the request form to the Graduate Dean's Office, along with two hard copies of your dissertation (one copy bound in a 3-ring binder, one loose copy bound with a binder clip for format review), and one CD with the PDF file of your dissertation (saved as "Last name, First name, Title of Dissertation") **A MINIMUM OF TWO WEEKS BEFORE THE SCHEDULED FINAL ORAL EXAM DATE.** The Graduate Dean's Office will secure an outside chairperson. Notice of your defense will be emailed to all faculty and posted outside the Graduate Dean's Office.
5. ___ See the Graduate Reader in the Graduate Dean's Office for format approval and printing of your signature pages on acid-free archival paper a couple of days before your defense.
6. ___ Take at least three approved signature pages (printed on acid-free archival paper) to your defense so that your committee members may sign them there. This will save you time later.

7. ___ After your defense and all changes required by your committee have been incorporated, take the final version of your dissertation to the Graduate Dean's Office for a final format check before the posted deadline on the Graduate Dean's website.
8. ___ Complete the Survey of Earned Doctorates through the Survey of Earned Doctorates PDF link on the Graduate Dean's Office website.
9. ___ TurnItIn form signed by supervising professor and student.
10. ___ After final formatting has been approved by the Graduate Dean's Office, take a CD with the PDF of your dissertation (saved as "Last name, First name, Title of Dissertation") to the Copy Center to have 3 hard copies (minimum) made. **The Copy Center hours are 8:00 a.m. to 3:30 p.m., Monday through Friday.** The Copy Center will send one bound copy to your supervising professor, one to your department, and one to the library. Copy Center will notify you when personal copies are ready for pick-up.
11. ___ **Last Step:** Submit dissertation to UMI online at www.etdadmin.com/utdallas.edu.

Doctoral Candidates- Abstract maximum = 350 words