Department of Mechanical Engineering

GRADUATE STUDENT HANDBOOK

This guidebook contains graduate school and mechanical engineering department graduation requirements as well as department policies. Although this guidebook is intended to be a common source of all information, it is ultimately a student's responsibility to verify graduation requirements and necessary deadlines. Questions or suggestions on the guidebook's content should be directed to the Chair or associate chair of graduate affairs.

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1. ADMISSION REQUIREMENTS

A. Admission to the Mechanical Engineering MS and Ph.D. programs is subject to the requirements of the Texas Tech University Graduate School. Complete details regarding admission may be obtained from:
https://www.depts.ttu.edu/gradschool/admissions/howtoapply.php

2. UNIVERSITY ACADEMIC REGULATION

2.1. University's regulations

A. University Academic Regulation can be found at: **https://www.depts.ttu.edu/gradschool/academic**

B. Requirements for graduate enrollment are outlined in TTU OP 64.02. Below, we summarize the important details and provide additional rules/recommendations for ME.

2.2. Full-time study & residency

	MS Student (min - max)	Ph.D. Student (min - max)
Spring	**9 – 16**	**9 – 13**
Fall	**9 – 16**	**9 – 13**
Summer I	**3 – 6**	**3 – 6**
Summer II	**3 – 6**	**3 – 6**

A. Minimum credits for both Spring and Fall semesters are required for all graduate students

B. Supported students (see section 8.1) must take the minimum number of credits in all semesters (Spring, Fall, Summer 1, and Summer 2).

C. Students who fail to register when required without an official leave of absence are subject to review for readmission by the standards in effect at the time of reconsideration.

D. Exceptions for full-time employment require approval by the Graduate Dean.

E. The number of hours for which students must enroll in each semester depends on their level of involvement in research and their use of university facilities and faculty time. Students in residence who are devoting full-time to research should enroll for 9 to 12 hours.

2.3. Required thesis/dissertation hours & continuous enrollment

A. Once a student has started their thesis/dissertation research, the following requirements must be followed.

- i) Enroll in 6000/8000 courses
  - (1) At least 6 hours of 6000 is required for the master's thesis
  - (2) At least 12 hours of 8000 is required for a doctoral dissertation.
  - (3) The course should be under the supervision of the committee chairperson
  - (4) Can be supervised by other committee members directly involved in research
  - (5) May not enroll in 6000/8000 courses before formal admission to a degree program

B. Maintain continuous enrollment by registering for 6000/8000 courses in each regular semester and once each summer until degree requirements are completed

- i) Off-campus students may register for 1 hour of 6000 or 8000 with departmental approval until their final semester, at which time they enroll for at least 3 hours.

2.4. Maximum allowable graduate hours

A. Students who are not making timely progress toward completion of the doctoral degree are subject to termination by the graduate dean.
B. Doctoral program
    i) The Texas Legislature has capped fundable graduate study at 99 doctoral hours.
        (1) Students with more than 99 doctoral hours will pay out-of-state tuition.
        (2) The maximum time allowed for completing the doctoral degree is EIGHT years from the first doctoral semester or FOUR years from admission to candidacy, whichever comes first. The graduate dean must approve exceptions or extensions in advance.
C. Non-doctoral programs
    i) Students beyond the maximum allowable graduate hours as determined by the Texas Legislature may be required to pay out-of-state tuition, regardless of residence status.
    ii) The maximum time allowed for completing a master's degree is six years.
    iii) The graduate dean must approve exceptions or extensions in advance.

2.5.Registration for the semester of graduation

A. There are three official graduation dates: December, May, and August.
B. Every candidate must be registered in the Graduate School in the session of graduation.
C. Non-thesis/dissertation students must register for at least 1 hour of non-thesis coursework if all other requirements are met.
D. Students pursuing a thesis/dissertation must register for at least 3 hours of a 6000/8000 course in the semester of their graduation.
E. Failure to graduate at the expected time requires satisfying continuous enrollment in the following semester
F. A new "Statement of Intention to Graduate" is required for each semester.

2.6.Leave of absence

A. Official leave of absence, which is granted by the dean of the Graduate School upon departmental recommendation, may be requested only in case of serious medical conditions and other exceptional reasons.
    i) Normally, leaves of absence will not exceed one year.
    ii) Leaves of absence do not extend the maximum time allowed for completion of the degree.
    iii) Students are granted an official leave of absence from the program for medical or other exceptional reasons.

3. ACADEMIC PROBATION AND SUSPENSION

3.1. Policies regarding academic probation are outlined in OP 64.04.

A. In brief, every student enrolled in the Graduate School, whether working toward a degree or not, is required to maintain a high level of performance and to comply fully with the policies of the institution. The Graduate School reserves the right to place on probation or to suspend any post-baccalaureate or graduate student who does not maintain satisfactory academic standing or who fails to conform to the regulations of the university. These include,

B. Academic probation for students whose cumulative GPA falls below 3.0 is placed on academic probation, and they have two consecutive semesters to raise their cumulative GPA

C. Suspension for one semester for a student who fails to raise their GPA during academic probation or for unprofessional conduct such as cheating or plagiarism

D. Dismissal for continued unsatisfactory performance.

E. In accordance with OP 64.07, any student who has been suspended may appeal

3.2. The mechanical engineering program standards and review procedures for probation and suspension.

4. COMMON POLICIES FOR ALL GRADUATE DEGREES

A. Outlined below are common policies for all Mechanical Engineering graduate students.

4.1. Outside-department course

A. Although there is a possibility that a graduate student can take courses outside the ME department, please be advised that you need pre-approval to do so. Otherwise, the course may not be counted as effective and helpful in your degree plan. Please consult your advisor or graduate advisor before you register for any outside department course.

4.2. Graduate Seminar

A. One credit hour of the graduate seminar (ME 5120) is required for all on-campus graduate students. Students register for this course in their first full-time graduate semester. Policies regarding attendance and grading are provided in the course syllabus. MS and PhD students must attend seminars in the first four long semesters.

4.3. Transferring courses and fulfilling requirements in a degree plan.

A. Policies of the graduate school and registrar supersede those here if there are conflicts. Transfer of credits policy is documented in the TTU academic catalog: https://catalog.ttu.edu/content.php?catoid=2&navoid=188#general-information

B. Students may transfer credits from a previously completed graduate degree to their Ph.D. or masters.

C. Transfer of non-specific course work credits

i) A doctoral student can transfer up to 30 credit hours towards a PhD of non-specific coursework from externally/internally completed graduate degrees or work completed in residence at another accredited graduate school.

ii) A master's student can transfer a maximum of 6 credit hours from work completed in residence at another accredited graduate school.

iii) Transfer is not automatic and is done at the discretion of the student.

iv) Transfer of credits occurs only if approved by the department and the graduate school.

D. Students can use non-specific course transfer credits to fulfill the course requirements of either the MS or PhD degree plan

i) If the courses were taken at TTU, the student had a B or higher, and they are part of the new degree plan, the use is immediately approved.

ii) For other courses, students must,

(1) Specify a single degree plan component they are attempting to satisfy

(2) Provide a syllabus and grade achieved of the external course to the associate chair of graduate studies.

(3) The associate chair will approve/disapprove of the course as a replacement for the specified degree plan component.

(4) Each course and credit can only be used once

4.4. Maximum allowable C's

A. The department will permit only a single grade of C for courses listed on the Official Degree Plan. If a student earns two or more C's or any single grade less than C, he or she must meet with a group consisting of the Faculty Advisor, Advisory Committee, and the Department Graduate Advisor. This group will recommend appropriate action, which may include probation or suspension by the Department.

4.5.Degree plan

A. All graduate students are required to submit a degree plan during their first semester. Forms for the degree plan can be found here: https://www.depts.ttu.edu/me/grad/

4.6.Expectations of Faculty

A. Students should expect the faculty to be committed to creating a scholarly environment where effective learning and professional growth are enhanced. Actions toward this goal include, but are not limited to, the following:
   i) providing opportunities in core courses for students to develop a graduate-level understanding of mechanical engineering principles
   ii) challenging and stretching students to achieve high standards of excellence
   iii) encouraging students to broaden their knowledge of mechanical engineering as well as to develop expertise in an area of research
   iv) including new technology areas in elective and core courses.

4.7.Conflict Resolution

A. It is possible that some conflict may develop between a student and a faculty member. This may include issues with a professor in a course they take, their faculty advisor, the professor teaching a course they TA, or many other unenumerated roles. Hopefully, such issues are of a small nature and can be worked out between students and faculty members. However, if such issues become significant, impacting either the student's or faculty members' ability to perform their duties, the following procedures should be followed.
B. If the issue involves a student's TA/GPTI performance, see section 7; if it involves a student's academic progress, or research progress, see section 6.
C. Otherwise, the student/faculty member should first contact the student's faculty advisor and seek guidance or help in resolving the issue.
D. If the issue is not resolved or is between the student and their faculty advisor, any party involved may contact the associate chair of graduate studies to help resolve the issue.
E. The associate chair will conduct a meeting with all parties and attempt to help resolve any ongoing problems and find a mutually beneficial outcome.

5. M.S. DEGREE REQUIREMENTS

A. The master's is a graduate degree requiring an additional 18 to 24 months of study beyond the undergraduate degree, BSME. General information on graduate requirements for MS degrees and steps for graduation can be found at: https://www.depts.ttu.edu/gradschool/academic/MastersPrograms.php.

B. Below, we present information specifically concerning the Master of Science in Mechanical Engineering (MSME).

5.1. Leveling Requirements

A. Students who have undergraduate/graduate degrees from technical disciplines outside mechanical engineering will be required to take leveling courses.
   i) At a minimum, these courses include,
      (1) Six hours of thermal/fluid science courses (e.g., ME 3322, ME 3370, ME 3371)
      (2) Six hours of mechanical science courses (e.g., ME 2311, ME 3331, ME 3433, ME 3464)
   ii) Computational Methods (ME 2315)
   iii) All undergraduate math courses in the BSME curriculum

B. If a student can show completion of equivalent courses in their undergraduate/graduate degree, they will count towards the leveling requirement.

C. Additional courses may be required depending upon the background of the student and will be assigned on a case-by-case basis by the Associate Chair of Graduate studies and/or the student Advisory Committee.

D. Leveling courses do not apply toward the requirements of the MSME degree.

5.2. MSME Common Requirements

A. The graduate seminar requirement (section 4.2)
B. A minimum total of 30 credit hours
C. Must take 2 math courses (6 hours) from the following list
   i) ME 5301 Analysis of Engineering Systems
   ii) ME 5302 Numerical Analysis of Engineering Systems or CE 5310 Numerical Methods
   iii) ME 5329 Computational Modeling
   iv) ME 5343 Computational Mechanics
D. Must take 3 courses (9 Hours) from the following list
   i) ME 5351 Advanced Engineering Design
   ii) ME 5352 Probabilistic Design
   iii) ME 5311 Advanced Dynamics
   iv) ME 5312 Control Theory 1
   v) ME 5340 Elasticity
   vi) ME 5338 Advanced Fluid Mechanics
   vii) ME 5321 Thermodynamics
   viii) ME 5327 Advanced Heat Transfer
   ix) ME 5358 Biomaterials
   x) ME 5313 Control Theory II
   xi) ME 5343 Contact Mechanics
   xii) ME 5317 Robot & Machine Dynamics

E. Take 5 courses (15 credit hours) in ME graduate courses
   i) For thesis option, 2 courses must be ME 6000
   ii) A maximum of one graduate course outside of ME in other science and engineering departments
   iii) Up to 3 credit hours of ME 7000
E. Faculty advisor
   i) Each graduate student must have a Faculty Advisor from the Graduate Faculty of the Mechanical Engineering Department to advise them on academic and thesis matters. The Faculty Advisor will assist the student with the selection of a thesis topic and the courses needed to satisfy the requirements of the MSME degree.

5.3. MS Program Options

A. Coursework option
   i) In addition to the common requirements, students must take an additional 9 hours of graduate-level coursework designated in Section 5.2.
   ii) Associate Chair for Graduate Studies will serve as the Faculty Advisor.
   iii) A final examination to be administered and approved by the ME departmental Graduate Advisor. The exam will be geared toward courses taken by the student toward the student's core courses/concentration area.

B. Thesis option
   i) In addition to the common requirements, students must take an additional 3 hours of graduate-level coursework designated in Section 5.2
   ii) Six hours of ME 6000 must be taken.
   iii) A master's thesis and oral defense are required for graduation.
      (1) The thesis is the result of original and significant research conducted by the students under the supervision of the Faculty Advisor and Advisory Committee.
      (2) The written thesis must be submitted to and approved by the graduate school and approved by the student's Advisor and Advisory Committee.
      (3) An oral defense to their Advisory Committee is required.
      (4) A draft of the thesis must be provided to the Advisory Committee at least one week prior to the defense.
      (5) The date and place of the defense presentation must be advertised two weeks in advance of the defense, and the presentation must be open to the public.
   iv) Students must find a graduate faculty member willing to act as their faculty advisor.
   v) Students must assemble an Advisory Committee by the end of their second semester composed of at least two Graduate Faculty Members.
      (1) The committee is chaired by the Faculty Advisor.
      (2) The committee must include a minimum of one additional Graduate Faculty Member.

5.4. Distance Learning Masters

A. Seminars are not required for students enrolled in the MS distance program.
B. Only the coursework option is available.

5.5. MS Accelerated Program Requirements

A. An undergraduate student who has earned 90 hours of course credit and who has at least a 3.0 GPA in their major subject courses may enroll for the BS/MS accelerated program.
B. Students may not receive both graduate and undergraduate credits for the same course, except for up to 9 hours when a student is admitted into the BS/MS accelerated program.
   i) These double-counted courses need to meet the requirements specified in Sections 5.2 &5.3 and approved by the Associate Chair for Graduate Affairs to be counted to satisfy the BS/MS accelerated program requirements.
C. Students must satisfy the requirements of both the BS and MS programs, including the number of credit hours and course distribution, as specified by the respective program rules.

6. PHD DEGREE REQUIREMENT

A. The PhD is a graduate degree requiring an additional 36-60 months of study beyond the undergraduate degree, BSME. The primary goal of a PhD student is to complete research leading to the successful defense of a thesis dissertation. Therefore, students' true measure of progress is not based on hours worked but progress made towards defense. It is awarded to students who have completed a program of graduate courses, a final examination, and a dissertation.

B. General information on graduate requirements for PhD degrees and steps for graduation can be found at: https://www.depts.ttu.edu/gradschool/academic/Doctoral_Students.php

6.1.Faculty advisor and advisory committee

A. Faculty advisor

i) Each graduate student must have a Faculty Advisor from the Graduate Faculty of the Mechanical Engineering Department to advise them on academic, thesis, or report matters.

ii) Most PhD students who arrive at TTU mechanical engineering will already have an advisor assigned to them when arriving, which will be made clear in the offer letter, which outlines their acceptance, means of support, and an advisor.

iii) On rare occasions, a new PhD student may not have an advisor in their first semester. These students are advised by the Associate Chair of Graduate Studies during their first semester. During this time, students should seek to find a faculty advisor within the faculty. Upon mutual agreement, the student should then report to the Department Graduate Student Advisor, who will be their faculty advisor by the end of the first semester of attendance.

iv) Students should expect their faculty advisor to be committed to creating an environment where effective learning and professional growth are enhanced. Actions toward this goal include, but are not limited to, providing

(1) Opportunities for professional development
(2) Opportunities to present at local, national, and international conferences
(3) Advice to help achieve long-term professional goals
(4) Resources necessary to accomplish the research project
(5) Prompt and responsive feedback to work product
(6) An environment conducive to research and free exchange of ideas

B. Advisory committee

i) Each student pursuing the PhD program must also have an Advisory Committee to assist with academic and dissertation matters. This committee is

(1) Chaired by the Faculty Advisor
(2) Composed of a minimum of 3 additional graduate faculty members
(3) 2 ME faculty members
(4) 1 external TTU graduate faculty
(5) 1 Graduate Dean's representative.

ii) This committee is responsible for the comprehensive examination and approval of the dissertation. This committee should be selected shortly after the student has selected a Faculty Advisor and prior to the end of the first year of attendance. Committee membership is formalized when the student files for admission to candidacy.

6.2.Research

A. To reiterate, no matter what mechanism of support, the fundamental goal of a supported student is to conduct research related to the project to which they are assigned by their thesis advisor, culminating in a dissertation of original research. The specifics of research duties will be communicated to the student by the faculty advisor and may include (but are not limited to) the following,
B. Conducting original research through experiments, simulation, or theoretical calculations as related to their research project
C. Taking responsibility for laboratory safety, maintenance, and training of new personnel
D. Self-educating through independent reading and literature search of academic journals
E. Academically challenging and stretching fellow graduate students and faculty by discussing their own work and others' work for the personal growth of themselves and others
F. Seeking expertise outside of your lab/advisor to achieve research goals
G. Continuously pursuing research goals and a deep understanding of both general mechanical engineering principles and their specific research area

6.3. Evaluation of Research Progress by Faculty Advisor

A. Continuation of support for all supported students depends upon the satisfactory performance of their assigned duties as well as their academic progress, including both coursework and research. Therefore, evaluation of research progression is essential. The following guidelines will be used by advisors for evaluation.
B. A meeting every semester, which should include the following…
   i) Setting goals for the upcoming semester in terms of tangible products and progress
   ii) Discussion of achievement related to goals from the previous semester
   iii) Outlining areas where improvement is needed for the student
   iv) Discussion of resources the student may need to achieve their goals more easily
C. Grade in courses related to research output, such as ME 7000, 8000, or similar
D. Tangible research output, including papers, conference presentations, etc.
E. The faculty advisor should document details of the discussion, grades, and products each semester
F. If a student fails to progress and meet faculty expectations as documented in semesterly meetings, the following process will occur,
G. A meeting will occur between the student, faculty advisor, and associate chair of graduate studies
H. The advisor should provide documentation of where students have been struggling
I. The student should provide a response to such issues
J. The three participants will create a remediation plan for improvement. It should include,
   i) Specific goals
   ii) Timeline for achievement
   iii) Consequences
   iv) Signatures of all 3 parties
K. If performance does not improve per the remediation plan, cessation of support by the department or advisor may occur.

6.4.Coursework & Credit Hours requirements

A. The doctorate requires a minimum of 60 credit hours of coursework and 12 hours of Research Credit at the doctoral level.
   i) A minimum of 36 hours of lecture courses and graduate seminar
   ii) A minimum of 24 hours of ME 7000, typically with the student's advisor
   iii) A minimum of 12 hours of ME 8000
      (1) Students should not register for ME 8000 courses until they have completed their Qualifying Exam section 6.5.

B. The lecture courses must meet the following requirements:
   i) A student will be required to take 6 hours of math courses from 2 different groups outlined below, completed in the first 2 semesters.
      (1) ME 5301 Analysis of Engineering Systems, MATH 5310 Principles of Classical Applied Analysis I, or MATH 5311 Principles of Classical Applied Analysis II, ME 6330 Vectors and Tensor Analysis
      (2) ME 5302 Numerical Analysis of Engineering Systems, MATH 5334 Numerical Analysis 1, Math 5335 Numerical Analysis 2, STAT 5384 Statistics for Engineers and Scientists 1, STAT 5385 Statistics for Engineers and Scientists 2, or CE 5310 Numerical Methods in Engineering
   ii) 6 hours of courses from a single core concentration area listed below in the first 4 semesters.
      (1) Materials and Mechanics: ME 5340 Elasticity, ME 5342 Fracture and Failure Analysis, ME 5343 Contact Mechanics of Engineering Materials, ME 5345 Computational Mechanics I, ME 5337 Mechanics of Nanomaterials, ME 5358 Biomaterials, or ME courses approved by the graduate program chair.
      (2) Thermofluids and Heat Transfer: ME 5321 Thermodynamics, ME 5322 Conduction Heat Transfer, ME 5325 Convection Heat Transfer, ME 5326 Combustion, ME 5327 Advanced Heat Transfer, ME 5335 Mathematical Models of Turbulence, ME 5336 Computational Fluid Dynamics, ME 5338 Advanced Fluid Mechanics, ME 5360 Bio-Fluid Mechanics, or ME courses approved by the graduate program chair.
      (3) Dynamics and Controls: ME 5311 Advanced Dynamics, ME 5312 Control Theory I, ME 5313 Control Theory II, ME 5314 Nonlinear Dynamics, ME 5316 Advanced Vibrations, ME 5317 Robot and Machine Dynamics, or ME courses approved by the graduate program chair.
      (4) Design: ME 5352 Probabilistic Design, ME 5356 Digital Human Modeling for Human-Centric Design, ME 5351 Advanced Engineering Design, or ME courses approved by the graduate program chair.

C. A total of 18 credit hours within the mechanical engineering department, which includes core concentration courses but excludes math requirements.

D. The balance of remaining courses may be selected from mathematics, science, and engineering with the approval of the Faculty Advisor and Advisory Committee. All must carry graduate credit.

E. Leveling
   i) Students with a bachelor's degree in a field other than mechanical engineering may be required to take undergraduate leveling courses in preparation for graduate studies in mechanical engineering. The leveling course requirements are determined by the associate chair of graduate studies upon the student's admission to the Ph.D. program.

6.5. Journal publication requirement

A. The Department of Mechanical Engineering requires that all its PhD candidates have at least two peer- reviewed journal publications prior to the defense of their PhD thesis. Journal publications are approved by the chair of the students committee and the associate chair of graduate studies.

6.6.Qualifying exam

A. The goal of this exam is to consistently evaluate PhD students' research skills, critical thinking, and oral/written communication. No attendees are allowed to participate in this exam.

B. Timing
   i) The exam should take place in the student's 4th semester (not including summer semesters) and after completion of core & math courses
   ii) The exact timing is left to the advisor, student, and committee

C. Committee Composition
   i) The committee will consist of 5 faculty members.
      (1) The first 4 committee members are identical in composition to the PhD advisory committee
      (2) Faculty advisor
      (3) 2 ME faculty Members
      (4) 1 External Faculty member or 1 Additional ME Faculty Member
   ii) One of the graduate committee members will be the 5th committee member. In case the faculty advisor is one of the graduate committee members, a different graduate committee member should serve as the 5th committee member.
      (1) The role of the graduate committee member is to ensure consistency across exams, procedures are followed, and to act as the tie-breaking vote.

D. Exam Format
   i) 1 week prior to the oral exam, the student will provide a thesis prospectus of no more than 2500 words (~ 5 single-spaced pages) that describes and motivates their PhD Project. It should contain the following items
      (1) A statement on the topic of the research and an explanation of its importance
      (2) Concise review of literature
      (3) Description of the hypothesis or question of the research
      (4) Experimental methods and/or procedures
   ii) The students will present 20 minutes on their research progress at the oral exam
   iii) The committee will then have 40 minutes to question the student on topics.
      (1) Related to their oral presentation and their prospectus
      (2) Of the core mechanical engineering fundamental concepts relevant to the prospectus

E. Grading Criteria
   i) Committee members will vote to either pass or fail the student based on the following criteria
      (1) Demonstrated knowledge related to the topic of their prospectus
      (2) Ability to analyze and critically evaluate content in real time
      (3) Ability to provide answers clearly and succinctly
   ii) Passing shall be a majority vote of the committee
   iii) In the case of a tie vote, the 5th committee member (i.e., one of the graduate committee members) will act as the tie breaker

F. Notification
   i) The 5th member will notify the Associate Chair for Graduate Affairs of the exam result in case the 5th member is not the associate chair.
   ii) Student advisors will be notified by the graduate associate chair whether the student passes or fails the exam.
   iii) In case of a failing result, the associate chair will provide written feedback from the committee to the students and their advisor.

iv) The student's advisor will inform the student of their exam pass or fail and determine the next steps with the student.

G. Retake
   i) All students are allowed to attempt a single re-take.
   ii) The students would be asked to completely redo the qualifier process in all formats.

H. Failure of Qualifiers.
   i) Upon failing twice, the student will be asked to leave the PhD program in the ME department.

6.7. Research Proposal

A. The intent of the PhD Proposal is to demonstrate that the candidate understands the relevant scientific background, how the proposed research fits into the general field, and has original ideas for research to expand the 'state-of-the-art', bring in new information, or provide an original perspective on the central problem.

B. The Research Proposal should occur one year after passing the Qualifying Exam.
   i) The faculty advisor may request an extension in writing to the associate chair of graduate studies.

C. The candidate prepares a written Research Proposal covering the PhD project. It should include,
   i) An adequate search of the relevant literature
   ii) Outline of work already accomplished
   iii) Plans for proposed future work

D. The written research proposal must first be approved by the Advisor and then submitted to each Committee no less than ten (10) days before the date of the presentation.

E. The written proposal is then presented to the committee, who are given time for questions.
   i) The oral presentation by the candidate must include questions from the Committee.

F. Immediately following the presentation, the Committee determines a pass/pass/failure
   i) At the discretion of the committee, the candidate may repeat the defense one additional time within one semester.

G. The proposal should be completed a minimum of 6 months prior to the dissertation defense.

6.8.Dissertation and Final Oral Examination

A. The doctoral dissertation represents the results of original and significant research work in mechanical engineering conducted by the students under the supervision of the Faculty Advisor and Advisory Committee.
B. A dissertation is required of every candidate for a doctoral degree. This requirement is separate and apart from other requirements in doctoral programs; consequently, successful performance in other areas does not necessarily guarantee the acceptance of a dissertation.
C. For graduate school guidelines for the dissertation and oral presentation, follow this link: https://www.depts.ttu.edu/gradschool/academic/Doctoral_Students.php
D. ME requirements for written dissertation
    i) The dissertation work, as documented via ME 8000 courses, must earn a grade of at least B in order to qualify the student for graduation.
    ii) The thesis must be prepared and formatted in strict conformance with the requirements of the graduate school, which can be found at the following link: https://www.depts.ttu.edu/gradschool/academic/thesis_diss/defend_format_submit/DefendFormatSubmit.php
    iii) It is the student's responsibility to ensure that English usage is proper. Students are encouraged to employ assistance (typically students majoring in English) in correcting their thesis or report manuscripts prior to submittal to their Faculty Advisors.
E. Students must have a final public defense of their dissertation to their Advisory Committee. The following are the ME requirements for this presentation.
    i) The defense is scheduled by the student and the advisory committee and must occur prior to the defense deadline during the semester of graduation.
    ii) A draft of the thesis must be provided to the Advisory Committee three weeks prior to the defense.
    iii) An announcement of the defense must be given to the Department three weeks in advance of the defense.
    iv) The required Defense Notification Form, noting the time, place, and other information concerning the examination, is available on the website: https://www.depts.ttu.edu/me/grad/phd/index.php
    v) The advisory committee and the graduate dean or a professor designated to act in place of the graduate dean conduct the examination.
    vi) All members of the committee participate fully in the examination and cast a vote.
    vii) Professors, students, and other audience members outside the committee may participate in the examination but have no vote in determining the outcome.
    viii) At the conclusion of the examination, the chairperson of the advisory committee will send a written notice to the Graduate School giving the result of the examination.

7. FINANCIAL SUPPORT

7.1. Departmental support

A. The ME department provides Teaching Assistantship (TA), Research Assistantship (RA), and Graduate Part-time instructor (GPTI) to support qualified students.
   i) Research Assistantship (RA) via external funding obtained by a faculty member.
      (1) See OP 72.07 for university/college definition policies of Research Assistants.
   ii) Research Assistantship (RA) via internal/external fellowship awarded to a student
   iii) See OP 64.08 for university/college policies regarding such funding mechanisms
   iv) Teaching Assistantship (TA) via departmental funds or college funds
      (1) See OP 64.03 for university/college policies regarding such funding mechanisms
   v) Graduate Part Time Instructors (GPTI) via departmental or college funds
      (1) See OP 64.03 for university/college policies regarding such funding mechanisms

B. Student support can come from a single mechanism as outlined above or can be from a combination of the above. During their graduate degree the mechanism of funding may change based on departmental needs and/or advisor's resources.

C. Continuation of support for all funded students depends upon the satisfactory performance of their assigned duties as well as their academic progress including both course work and research.

7.2. Unfunded students

A. Unfunded students who choose to start a graduate degree acknowledge that they are not and may never be provided with any funding by the department or individual faculty.

7.3. Graduate School Support and Scholarships

A. Graduate school has various scholarships and fellowships which may help you financially.

B. Go and check: https://www.depts.ttu.edu/gradschool/financial/GeneralFellowships.php or send an E-mail to gradfellowships@ttu.edu for detailed information.

8. SUPPORTED STUDENTS' RESPONSIBIITIES

A. These policies are in addition to college/university OPs. Where there may be conflict between written policy in the graduate handbook and university/college OP, the OP supersedes policy here.

8.1. General Responsibilities

A. University policies OP 70.27: https://www.depts.ttu.edu/opmanual/OP70.27.php

B. All supported students will have to balance multiple responsibilities that can include coursework, research, academic enrichment, teaching, and other responsibilities. The overall time spent is variable based on support mechanism, advisor, project, and student's effort. It is expected that all supported students will spend at a minimum 50-60 hours/week on the sum of these activities if they wish to complete their degree within the mandated timeframe.

C. Vacation, Absence, and Leave

i) All Supported students are entitled to the TTU approved holiday schedule:

(1) https://www.depts.ttu.edu/hr/EmpBenefits/HolidaySchedule.php

ii) Further absences and requests for time off will be handled by,

(1) Department Chair/Graduate Program Chair for unassigned TA/GPTI

(2) Faculty advisor and Department Chair/Graduate Program Chair for assigned TA/GPTI

(3) Faculty advisor for RA

8.2. Teaching Assistants

A. Eligibility

i) General eligibility for a TA or outlined in OP 64.03.

(1) English proficiency is evaluated by the ITA program.

ii) Course Assignment

(1) Students will be assigned a course to TA on a semester-by-semester basis. Assignments will be made by the departmental leadership committee. Assignments will be based on several factors including,

(2) Student area of expertise

(3) Number of sections/students in courses

(4) Teaching needs

(5) Student's previous TA/GPTI experience

iii) When assigning a TA to multiple sections, the department will attempt to have them assigned to multiple sections of the same course whenever possible.

B. Workload

i) A full time TA workload toward teaching responsibilities is 20 hours/week.

(1) If partially supported through other means, total hours are adjusted equivalently (i.e. 0.5 TA is responsible for 10 hours/week).

ii) If assigned to multiple classes, the total workload is evenly divided amongst those classes and/or professors teaching those classes based on the total number of students in all sections. i.e.

(1) If sections have roughly equivalent numbers of students a TA's time would be divided evenly amongst those sections.

(2) If a TA was assigned to 3 sections and 1 had 2x as many students as the other 2, the TA's hours would be weighted such that ½ their time would be allocated to the larger section and ¼ each to the smaller ones.

iii) Workload hours are allocated on a weekly basis.

iv) Hours are not bankable or accrued over the course of time.

(1) A TA who only works 1 hour in a particular week does not have an additional 19 hours that can be used later.

v) TAs should never be asked, and they will not work extra hours beyond their total workload.

vi) However, an IOR may save up to 25% of the hours allotted to them for one week to use the very next week.

(1) Such occasions should be infrequent and not regularly scheduled.

(2) The TA should be provided with at least one week's notice before such an event.

C. TA responsibilities.

i) The general role of the TA is to assist the instructor of records in managing an assigned course. The TA should report to the professor/instructor in charge of their assigned course one week before the course begins. At this time, they will be informed of the general expectations and guidelines for the course.

ii) Each week the professor/instructor of record will contact the TA and set specific duties for them to accomplish. It is the responsibility of the instructor of record/supervisor to create a manageable workload for the TA and not exceed the TA's allocated hours for that section. Instructors should take care to estimate how long a specific task should take. For example, a single section of 45 students with homework that takes ~5 minutes to grade is 3h45m of work.

D. Which specific tasks that are assigned to the TA are the prerogative of the instructor of record for the assigned course. The following guidelines detail acceptable TA responsibilities

E. The following tasks are required of TAs, but not considered part of the hourly workload,
   i) Graduate students are assumed to be familiar with fundamental ME undergraduate courses
      (1) Reviewing basic concepts does not count towards their TA workload hours
      (2) If a TA chooses to attend class to review material on their own accord, this also does not count towards their workload hours.
   ii) Maintaining close communication with the professor in charge via email and short meetings to outline the necessary activities
   iii) Maintaining and providing a record of worked hours so instructor of record can evaluate performance (if requested)

F. Any or all of the following activities are reasonable requests of a TA and count towards their weekly workload.
   i) Preparation to learn a specific, non-fundamental skill. This may include,
      (1) Learning to use unfamiliar software
      (2) Learning to operate a specific tool/equipment
      (3) Learning content for higher level/specialty classes such as electives or advanced courses not typically taught at most schools
   ii) Grading laboratory reports, homework assignments, projects, quizzes, etc.
      (1) Instructors of record should provide grading rubric and review TA's work to ensure consistency and correctness if the TA does not meet the requirements to be an instructor of record as set out below.
   iii) Grading multiple choice exams, individual exam problems, or sub sections of an exam.
   iv) Preparing notes for discussion sessions
   v) Running discussion sessions
   vi) Running extra review sessions
   vii) Providing office hours
   viii) Creating solution sets
   ix) Attending classes
   x) Creating content for online resources such as help videos, review problems, etc.
   xi) Adding specific content to an online resource
   xii) Maintaining course grade sheet or inputting specific grades into online grade book
   xiii) Conducting a lecture in the absence of the instructor of record
      (1) This should only occur if faculty members are temporarily off campus due to scheduled work-related travel or emergency

G. The following activities should not be asked of any TA,
   i) Grading entire exams or large sections of exams. All instructors of record should take part in grading student exams; grading of exams in their entirety should not be left to TA.
   ii) Regularly teaching class
   iii) Running or creating online class portals
   iv) Acting as IT support for the faculty member online resources...i.e. if a faculty member is unsure of how to implement something on blackboard (or similar sites) they should not attempt to have the TA solve this problem or figure out how to achieve this.
   v) Any task not related to the specific class the TA is assigned to.

H. Evaluation and Management of TA

i) TA's performance will be evaluated every semester using the following resources:
   (1) The relevant supervisors will be provided with a TA evaluation form to give both numerical feedback and/or specific comments on a TA's performance.
   (2) Reports of TA misconduct/issues provided to the department via the dean of students.
   (3) Direct complaints of performance to either the Department Chair or the associate chair of graduate studies.

ii) If a semester evaluation of a student indicates significant deficiencies or direct complaints indicate the need for immediate action, the following will occur,
   (1) A meeting will occur between student, faculty advisor, and associate chair of graduate studies
   (2) The associate graduate chair will provide documentation that indicates the student is underperforming in their duties.
   (3) The student and advisor can provide a response/explanation.

iii) The three participants will create a remediation plan for improvement. It should include,
   (1) Specific goals
   (2) Timeline for achievement
   (3) Consequences

iv) Signatures of all 3 parties

v) If performance does not improve per the remediation plan, cessation of support by the department may occur.

8.3.Graduate Part Time Instructor

A. Eligibility
   i) General eligibility for a GPTI is outlined in OP 64.03 and 32.36
   ii) English proficiency which is evaluated by the ITA program.
   iii) GPTI's must have completed at least 18 hours of graduate work or have a MAs in the field they teach.

B. Course Assignment
   i) Students will be assigned a course to GPTI on a semester-by-semester basis. Assignments will be made by the departmental leadership committee. Assignments will be based on several factors including,
   ii) Student area of expertise
   iii) Number of sections/students in courses
   iv) Teaching needs
   v) Student's previous TA/GPTI experience

C. Workload
   i) A full time GPTI workload toward teaching responsibilities is 20 hours/week.
      (1) For a GPTI, a 3-credit class is considered 10 hours of work (~3 hours teaching in the classroom and ~7 hours of work outside the classroom)

D. GPTI Responsibilities
   i) GPTI's are assumed to be familiar with fundamental ME undergraduate courses due to the eligibility requirements to be a GPTI. Therefore, general reviews of material are not considered part of their weekly workload. The following activities are considered part of their workload,
      (1) Creating and providing a syllabus for the course
      (2) Creation of all lecture content, handouts, homework, tests, etc.
      (3) Grading of all lab reports, homework, assignments, etc.
      (4) Communicating with instructors of record in the case that a GPTI is primary instructor.
   ii) The above activities are not an exhaustive list, and a GPTI may perform other activities in their role as a primary instructor of record. Therefore, it is important to note that the primary responsibility of a GPTI is to successfully orchestrate and manage a class for an entire semester taking on all duties/responsibilities that come with that.

E. Evaluation and Management of GPTIs
   i) GPTI's performance will be evaluated every semester using the following resources:
   ii) GPTI's course evaluation scores as recorded by TTU will be reviewed by the department.
   iii) Reports of GPTI misconduct/issues provided to the department via the dean of students.
   iv) Direct complaints of GPTI performance to either the Department Chair or the associate chair of graduate studies.
   v) If a semester evaluation of a student indicates significant deficiencies or direct complaints indicate the need for immediate action, the following will occur,
      (1) A meeting will occur between student, faculty advisor, and associate chair of graduate studies
      (2) The associate graduate chair will provide documentation that indicates the student is underperforming in their duties.
      (3) The student and advisor can provide a response/explanation.
   vi) The three participants will create a remediation plan for improvement. It should include,
      (1) Specific goals
      (2) Timeline for achievement

(3) Consequences
(4) Signatures of all 3 parties

vii) If performance does not improve per the remediation plan, cessation of support by the department may occur.

8.4.PhD Student Performance Evaluation

A. For Ph.D. students who do not perform well in research, the following actions will be taken:

i) Grade for ME 7000 will be assigned to I or C by student's faculty advisor

ii) Student's faculty advisor will send an email to the Associate Chair for Graduate Affairs and the graduate academic advisor to inform them that this student did not perform well in research

iii) Student's faculty advisor will ask this student to fill out the form for performance evaluation

9. APPENDIX I. DEPARTMENTAL SAFETY PROTOCOLS

A. The safety protocols can be viewed and downloaded at: https://www.depts.ttu.edu/me/safetyplan.php