HANDBOOK OF DOCTORAL PROGRAM IN MECHANICAL ENGINEERING (PhD/ME):

ACADEMIC POLICIES & PROCEDURES

Department of Mechanical Engineering
The University of Texas San Antonio

Fall 2013
I. Areas of Study
The Department of Mechanical Engineering offers advanced coursework integrated with research leading to the Doctor of Philosophy degree in Mechanical Engineering. The program has three concentrations: Thermal and Fluid Systems, Design and Manufacturing Systems, Mechanics and Materials. The Ph.D. degree in Mechanical Engineering will be awarded to candidates who have displayed an in-depth understanding of the subject matter and demonstrated the ability to make an original contribution to knowledge in their field of specialty.

II. Program Administration
The Doctor of Philosophy degree in Mechanical Engineering resides within the Department of Mechanical Engineering. The Mechanical Engineering Graduate Program Committee administers it. The Graduate Program Committee is responsible for curriculum enhancement, program development and promotion, student recruitment, admission, and on-going program review and provides input to the Chair and the graduate faculty of the department.

The Graduate Advisor of Record (GAR) is appointed by the department Chair and is responsible for the routine administration of the program, advising students, maintaining records, and representing the Department in matters related to the program. Questions about degree requirements and academic policies should be directed to the Graduate Advisor of Record.

III. Admission Requirements
The minimum requirements for admission to the Doctor of Philosophy in Mechanical Engineering degree program are as follows:

☐ Student must meet the university admission requirements as outlined in the graduate catalog.

☐ Students whose native language is not English must have a satisfactory English test score to meet the university admission requirements.

  http://graduateschool.utsa.edu/international-students/gre-gmat-toefl-ielts/

☐ Satisfactory GRE (Graduate Record Examination) scores, as evaluated by the Graduate Program Committee of the Department of Mechanical Engineering, are required in combination with other criteria for admission to the Doctor of Philosophy in Mechanical Engineering degree program at UTSA.

☐ Normally, a student must hold a Master's degree in mechanical engineering or in a related field with a GPA of 3.3 or better in both his/her undergraduate and graduate studies for admission to the Doctor of Philosophy in Mechanical Engineering degree program at UTSA.
Outstanding students, who do not hold a Master's degree, may enter the Doctor of Philosophy program on provisional status directly upon receiving a bachelor's degree in mechanical engineering or a closely related field, with the approval of the Graduate Studies Committee. Such applicants must have a GPA of 3.5 or better in the last sixty (60) semester credit hours of undergraduate coursework in mechanical engineering or a closely related field. A student with provisional status must satisfy the provisional requirements within the first two (2) years of study in order to proceed towards their Ph.D. degree. Provisional Requirements, if any, will be determined by the Graduate Program Committee.

The Graduate Program Committee will evaluate each applicant, approve the necessary requirements, and recommend corrective actions and admission on a case-by-case basis.

IV. Fellowships and Graduate Assistantships
All full-time students without outside employment, who apply to the program, are automatically considered for a doctoral student fellowship provided by the department, which is determined on a competitive basis. This fellowship is for one year, during which students are expected to seek funding with their advisors for the remainder of their PhD program. The fellowship amount is determined on a competitive basis and ranges between $20,000 and $25,000 for twelve months. Students receiving a departmental fellowship may be required to fulfill academic duties, such as being a teaching assistant or lab assistant, and conducting seminars. Medical benefits are not covered by the doctoral student fellowship. Applicants will be notified of their financial award in their admittance letter.

Financial support after the first year may be secured through Research Assistantship (RA) or Teaching Assistantship (TA). Typical appointments are “half-time” and require no more than 20 hours of service per week. The financial support for RAs is provided by individual faculty members from research grants, while support for TAs is provided by the department. Applicants are encouraged to contact faculty members to seek RA positions. Doctoral students who are not eligible to receive state-paid medical insurance will be personally responsible for paying the premiums for required insurance coverage.

V. Degree Requirements and Program of Study
The degree requires 90 credit hours of course and research work beyond the bachelor’s degree or 60 credits beyond the master’s degree, and passing of Qualifying Examinations, Dissertation Proposal, Dissertation Defense and acceptance of the Ph.D. dissertation.

Required coursework and the timeline for expected progress are given in Tables 1 and 2, respectively. In general, undergraduate courses, general education courses, and prerequisites for graduate courses do not count towards the required number of credit hours.
Students with MS degree may transfer a maximum of thirty (30) semester credit hours previously earned toward their doctoral degree with the approval of the Graduate Program Committee and the credit transferring will be approved on a course-by-course basis to satisfy the formal coursework requirements of the degree.

**Table 1** Curriculum (60 credit hours A through E) 

<table>
<thead>
<tr>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>A. Common Core Courses (6 credit hours): ME 6113 Experimental Techniques in Engineering is mandatory, with another one from the following list.</td>
<td></td>
</tr>
<tr>
<td>EGR 6013 Analytical Techniques in Engineering²</td>
<td>3</td>
</tr>
<tr>
<td>ME 6973 Special Problems: Advanced Mathematics in Engineering²</td>
<td>3</td>
</tr>
</tbody>
</table>

B. Technical Core Courses (12 credit hours): Students are required to take two courses (6 credits) in their Major Area of study, and one course each from other two minor areas from the following list.²

- **Thermal & Fluid Systems**
  - ME 5243 Advanced Thermodynamics 3
  - ME 5613 Advanced Fluid Mechanics 3

- **Design & Manufacturing Systems**
  - ME 5113 Advanced System Dynamics and Controls 3
  - ME 5503 Lean Manufacturing and Lean Enterprises 3

- **Mechanics & Materials**
  - ME 5413 Elasticity 3
  - ME 5713 Mechanical Behavior of Materials 3

Students are required to obtain a grade of ‘B’ or above for all the core courses.

C. Technical Elective Courses (6 credit hours): Students are required to take at least two (2) elective courses in consultation with their PhD advisors.

D. Seminar (3 credit hours are required taken in three semesters)

  - ME 7991 Research Seminar 1

E. Doctoral Research (18 credit hours required) and Dissertation (15 credit hours required)

  - ME 7983-6 Doctoral Research 3-6
  - ME 7993-6 Doctoral Dissertation (after admitted for candidacy) 3-6
**Table 2: Timeline of Progress**

<table>
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<tr>
<th>Progress</th>
<th>To be Completed</th>
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<tbody>
<tr>
<td>Select PhD Advisor</td>
<td>Within 9 credit hours</td>
</tr>
<tr>
<td>Pass Written Qualifying Examination</td>
<td>Within 18 credit hours</td>
</tr>
<tr>
<td>Form PhD study committee</td>
<td>At least one month before dissertation proposal defense</td>
</tr>
<tr>
<td>Pass Dissertation Proposal (A written proposal and an oral presentation are required) and be admitted to be PhD candidate</td>
<td>Time to be determined by the Supervising Professor and the Dissertation Committee [27–45 credit hours].</td>
</tr>
<tr>
<td>Pass Dissertation Defense (Oral Examination)</td>
<td>After passing dissertation proposal. Time to be determined by the Supervising Professor and the Dissertation Committee [&gt; 60 credit hours].</td>
</tr>
</tbody>
</table>

**VI. PhD Advisor**

The entire program of study, as well as the selection of major and minor areas, must be recommended by the student’s PhD Advisor by the end of 9 credit hours of the student’s coursework, approved by the Graduate Studies Committee, and must be submitted to the Dean of the Graduate School for final approval otherwise, students will be disqualified for financial assistance from the department. The courses taken by students are intended to focus and support the individual’s mastery of his/her particular area of specialization. The PhD Advisor must be a tenured or tenure-track faculty member of the Mechanical Engineering Department.

**VII. Written Qualifying Examinations**

All students seeking a doctoral degree at UTSA must be admitted to “candidacy” in order to become eligible to continue their research that leads to a PhD degree. The requirement for admission to candidacy is passing the qualifying examination and dissertation proposal. The qualifying examination of the PhD/ME program consists of written questions in both common and major areas of research interest of the student. The qualifying examinations will be administrated in June and January every year. A student may be allowed to take the examination a second time either in January or June the following year, if they fail the first time. However, no more than two attempts are permitted. Should a student fail the qualifying exam for a second time, he or she will be dismissed from the doctoral program. The student must follow the standard procedure to petition for reinstatement at the graduate level should he or she wish to return to the doctoral program. At the department's discretion, students may be reinstated to the MS degree. The process for petitioning for reinstatement is as follows:

A student who has been dismissed academically may petition for reinstatement after one long semester (Fall or Spring) has elapsed from the date of dismissal. Under exceptional circumstances, a petition may be considered earlier. Students are required to complete a
reinstatement packet along with a letter containing all explanations, recommendations, or doctors’ statements in support of the student’s request for reinstatement and submit them to the Dean of the Graduate School on or before June 15 for Fall Semesters, October 15 for Spring Semesters, or March 15 for Summer Semesters.

The Graduate School prepares the petition for reinstatement and submits it to the Department’s Graduate Program Committee. The Graduate Program Committee will review the petitioner’s letter and academic record and make a recommendation concerning reinstatement to the Dean of the Graduate School. If the Petition for Reinstatement is disapproved, the student may not file another petition until the following semester.

Process of Written Qualifying Examination: The written qualifying examination is given in June and January of each year. Upon approval by their PhD advisor, students wishing to take the examination must submit their request using the designated form to the Graduate Advisor of Record before **Oct. 31 (for January Exam) and March 31 (for June Exam)**. The written examination will be administered in **the first full week of June and the second week of January** each year. Normally, the written examination is taken by students who have completed the coursework listed under sections A and B of the curriculum in **Table 1** and are in good standing. Students who fail the written qualifying examination in their first attempt may petition for a second attempt. No more than two attempts are permitted to pass the written examination.

The purpose of the written qualifying examination is to ensure that students pursuing a doctoral degree in Mechanical Engineering have the essential depth and breadth of knowledge basis. The Department of Mechanical Engineering administers the written qualifying examination in the following four areas with the supporting courses:

1. Common area
   
   _EGR 6013 Analytical Techniques in Engineering_ (Advanced topics in vector calculus and linear algebra)

2. Technical areas
   
   a. Thermal & Fluid Systems (two subjects)
      
      _ME 5243 Advanced Thermodynamics_
      _ME 5613 Advanced Fluid Mechanics_
   
   b. Design & Manufacturing Systems (two subjects)
      
      _ME 5113 Advanced System Dynamics and Controls_
      _ME 5503 Lean Manufacturing and Lean Enterprises_
   
   c. Mechanics & Materials (two subjects)
      
      _ME 5413 Elasticity_
      _ME 5713 Mechanical Behavior of Materials_
The written qualifying examination includes two (2) parts: **Part 1-Common Area**, which is mandatory for all students, and **Part 2-Major Area**, which is selected by student from the three technical areas. The written exam is administered on the different areas in two days of the **first full week of June and the second week of January** each year. The exam for each area (Common Core, Thermal and Fluid Systems, Design and Manufacturing Systems, Mechanics and Materials) consists of six (6) questions to be answered in three (3) hours. The examinations are typically in the form of closed books and notes. If needed, students will be provided a formula sheet.

The minimum (passing) grade for each area in the Common Core and Major Areas are 75% and 70% respectively. Students who do not score the minimum grade only in one of the two areas may pass the exam on a conditional basis with the requirements (conditions) determined by the Graduate Program Committee. Students who pass the written qualifying exam conditionally must satisfy all additional requirements before having passed the written exam.

**VIII. Dissertation Committee**

The dissertation committee members are typically selected by the student in consultation with the PhD advisor and approved by the Graduate Advisor of Record and the Department Chair. This process should start as early as the time when the student has selected a PhD Advisor. The dissertation committee must be finalized at least one month before the dissertation proposal defense.

A dissertation committee includes the PhD advisor as the chair of the committee and a minimum of four members. Of the four members, at least two must be Mechanical Engineering graduate faculty members and one must be outside the department or UTSA, whose suitability will be subject to approval of the Graduate School. Part-time faculty may serve as members of the dissertation committee, but may not serve as PhD advisors.
IX. PhD Dissertation Proposal and Admission to PhD Candidacy

The student should first consider research topics for his/her dissertation, and then write a dissertation proposal based on preliminary results. Normally, the dissertation proposal is presented to the dissertation committee of the student within one year after passing the written qualifying examination. During this time, students can take ME 7983-6 Doctoral Research (Table 1, Section E). The dissertation proposal consists of quantifiable and verifiable objectives, literature survey, methodology, preliminary work, deliverables, and expected contribution.

A written dissertation proposal should be submitted to the student's dissertation committee at least two weeks before the oral presentation. The dissertation proposal should:

- explain the basic idea of the dissertation topic,
- describe why that topic is original, challenging, and important,
- present an overview of the related work in the field,
- state what kind of results are expected, and present preliminary results, if any, and
- make a plausible argument that the study can be completed within a proposed time line.

The student should write the dissertation proposal as soon as he/she can address the issues described above. The dissertation proposal should be typically single spaced and 25-30 pages long. A public presentation of the student's dissertation proposal will be arranged and followed by a closed-door questioning by the dissertation committee.

The oral presentation is typically a 40-minute talk, followed by a question-and-answer session. Following the public presentation, the dissertation committee will conduct a closed-door oral examination based on the proposal and on relevant background from the student's Program of Study. Only the dissertation committee members may attend the closed-door session. After the examination, the student will be asked to leave, and the dissertation committee will discuss the student's performance in the dissertation proposal presentation. The dissertation committee may recommend changes before approving the dissertation proposal. No more than two attempts are permitted for the student to get his/her dissertation proposal approved and be admitted as a PhD candidate.
X. Final Oral Dissertation Defense

After the approval of the dissertation proposal and be admitted to be a PhD candidate, the next steps are writing the dissertation and passing the final oral defense. During this time, students can take ME 7993-6 Doctoral Dissertation (Table 1, Section E). The final oral defense is administered and evaluated by the student’s PhD dissertation committee and covers the general field of the dissertation. The final oral defense consists of a public presentation of the dissertation, followed by a closed session with the members of the dissertation committee. It is expected that the material of the dissertation will be of archival quality and will be published in journals. The dissertation must be approved by a unanimous decision of the Dissertation Committee.

**IMPORTANT LINKS:**
ME Department: [http://engineering.utsa.edu/~mechanical/](http://engineering.utsa.edu/~mechanical/)
ME Faculty: [http://engineering.utsa.edu/~mechanical/faculty.html](http://engineering.utsa.edu/~mechanical/faculty.html)
Graduate School: [http://www.graduateschool.utsa.edu/](http://www.graduateschool.utsa.edu/)
Graduate Catalog: [http://utsa.edu/gcat/](http://utsa.edu/gcat/)

Attachments: Map from UTSA to SwRI

Map of SwRI
Main Gate at Culebra Rd

ME 6113 is taught in Building 77 (No. 18 on the map)