Graduate Student Handbook

DOCTOR OF PHILOSOPHY
IN
MECHANICAL ENGINEERING

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

Revised
August 2019
Doctor of Philosophy in Mechanical Engineering
# Table of Contents

**Introduction** ................................................................................................................................. 4

**Program Administration** .............................................................................................................. 5

- Area Faculty ................................................................................................................................. 5
- Graduate Education Committee ................................................................................................. 5
- Associate Department Head for Graduate Education ............................................................. 5

**Advising** ....................................................................................................................................... 5

- Research Advisor ....................................................................................................................... 5
- Graduate Program Coordinator ................................................................................................. 5

**Getting Started in the Graduate Program** .................................................................................. 6

- Orientation for International Students ..................................................................................... 6
- Department Orientation & Meeting Graduate Advisors .......................................................... 6
- Registration & Obtaining UTD Identification Card .................................................................. 6
- Graduate Teaching & Research Assistants ................................................................................ 6

**Program Facilities** ...................................................................................................................... 7

**University Facilities** .................................................................................................................. 7-8

**Application and Admission to Graduate Program** ................................................................... 9-10

- Application Process .................................................................................................................. 9
- Types of Admission .................................................................................................................... 10
  - Conditional Admission ........................................................................................................ 10

**Funding Opportunities** ............................................................................................................. 11

- Jonsson School Graduate Study Scholarship ............................................................................ 11
- Teaching Assistants .................................................................................................................. 11
- Research Assistants .................................................................................................................. 11

**Registration** ............................................................................................................................... 12

**Degree Plan and Academic Standing** ....................................................................................... 13-16

- Degree Plan ............................................................................................................................ 13-14
- Graduate Transfer Credit Policies ........................................................................................... 15
- Time Limits ............................................................................................................................... 15
- Catalog Policy .......................................................................................................................... 15
Doctor of Philosophy in Mechanical Engineering

Academic Standing........................................................................................................................................... 16
Graduate Grading Scale .................................................................................................................................... 16

Doctoral Program Requirements ...................................................................................................................... 17-20

Milestones Agreement Form ............................................................................................................................ 17
Timeline for Degree Completion ....................................................................................................................... 17
Qualifying Examination .................................................................................................................................... 18

Doctoral Candidacy and Dissertation ............................................................................................................. 19-20
Doctoral Candidacy .......................................................................................................................................... 19
Supervising Committee ..................................................................................................................................... 19
Comprehensive Examination/Dissertation Proposal ......................................................................................... 19
Doctoral Dissertation ......................................................................................................................................... 20

Career Advising .................................................................................................................................................. 21
Graduation .......................................................................................................................................................... 21

APPENDICES

Appendix A – Acknowledgment of Policies Form
Appendix B – Milestones Agreement Form
Appendix C – Mechanical Engineering PhD Degree Plan (Catalog 2017)
Appendix D – Mechanical Engineering PhD Degree Plan (Catalog 2018)
Appendix E – Mechanical Engineering PhD Degree Plan (Catalog 2019)
Appendix F – Transfer of Credit Request Form – MS to PHD
Appendix G – Committee Appointment Form
Appendix H – Qualifying Examination Study List
Appendix I – Qualifying Examination Application
Appendix J – Comprehensive Examination Checklist
Appendix K – Request for Comprehensive Examination
Appendix L – Comprehensive Examination Report
Appendix M – Request for Final Oral Examination
Appendix N – Final Oral Examination Report
Appendix O – Graduation Checklist

Key: Old Content              New Content
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 PhD program. This handbook, 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 education, please see the UTD Graduate Catalog.

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 PhD program in Mechanical Engineering prepares talented doctoral students for careers in which they will create new technologies and processes for the design, manufacture, control and operation of components and systems in energy, health care, security, defense, and transportation.

Given the key enabling role of mechanical engineering in all areas of technology, the graduates of this program will have the preparation to become technical leaders in emerging and existing scientific and industrial fields in Texas, the nation, and the rest of the world.
Doctor of Philosophy in Mechanical Engineering

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 Education Committee:
The role of the Graduate Education 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, catalog changes, and program requirements. Committee membership changes periodically.

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

Advising:
Research Advisor: The research advisor provides mentoring in research, guidance in course selections, career guidance, and assists in the preparation of the degree plan and Milestones Agreement Form. The research advisor supervises and must approve the student’s completion of the qualifying exam and other documents, such as proposals and papers leading up to degree completion. In general, PhD students have selected a research advisor upon entering the program. Under circumstances where a student enters the PhD program without a research advisor, the student will be given until their second semester to locate a research advisor. Part-time PhD students will be given four semesters (or completion of twelve credit hours at UTD) to select 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 policies, and other graduate student academic issues should be addressed to the graduate program administrator. 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 students can 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. At this orientation, students will meet with a faculty advisor and have their first semester courses approved 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.

Comet Cards are issued in the Comet Card Office, located on the second floor of the Student Services Addition (SSA 12.324).

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 Education, the ME department, and the Office of Human Resources.

The Office of Graduate Education orientation is a one day program.

The Office of Human Resources conducts an Employment Express event for all new employees. All new TA’s and RA’s must attend one of the scheduled Employment Express events to complete required forms which verify employment eligibility and set up payroll information.
Program Facilities

The Engineering and Computer Science Buildings, Bioengineering Science Building, and the Natural Science and Engineering Research Laboratory provide extensive facilities for teaching and research. These include wind tunnels, materials test systems, nanoindenter, high impact facilities, ultra-high speed camera, DMA, XPS, FTIR, NMR, TGA, DSC, XRD, μ-Raman, Fluorescence Spectrometer, AFM, FIB/SEM, and atomic resolution 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.

Machine Shop
The Mechanical Engineering Machine Shop gives students the experience of fabricating custom mechanical components or systems for class assignments, research and industry sponsors. The shop houses 10 computer stations with CAD software, several (CNC) computer numeric control milling machines, lathes, welding machines, different types of saws, a CNC and manual plasma cutter, precision measuring equipment and numerous hand tools.

University Facilities

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

Office of Graduate Education
The Office of Graduate Education is located in the Founders Annex corridor, at FA 3.104. The staff in this office oversee degree requirements and develop and implement educational policy. Students will find helpful information and important deadlines on the Office of Graduate Education website.

Computer Labs
Computer Labs for student use can be found on campus in the following locations:
Engineering Open Access Lab (ECSW 2.250)
Solarium (ECSN 4.324)
Machine Shop (NL 1.701A) *Limited access; only when Machine Shop staff are present.

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.

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 private meeting rooms, lounges, food service areas, billiards, and games. The Union is also home to 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.

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.
Application and Admission to Graduate Program

Application Process
A student applying for admission to the Mechanical Engineering Graduate Program must submit an online application 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.

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.

Requirements for Admission
The PhD 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 Education 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 PhD 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.
Doctor of Philosophy in Mechanical Engineering

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.

For students who are interested in pursuing a PhD 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 PhD 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, statement of purpose, and three letters of recommendation 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 ME graduate degree seeking students. Non-degree-seeking students who are ultimately admitted to a degree program may transfer no more than 15 credit hours of coursework taken as a non-degree student to that degree program. 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 student’s academic merit and prior research experience. After admission to the ME Department, students may be considered by the department’s selection committee for teaching assistantships. If selected for a TA position in their first semester, new students will be notified by an email sent to their UT Dallas e-mail address. Current students will be required to submit a TA application each semester they would like to be considered for a TA position. TA applications can be completed through the electronic application found [here](#), and must be submitted to the Mechanical Engineering Department office (ECSW 3.140).

**Research Assistants (RAs)** are supported by individual mechanical engineering faculty through faculty member’s research grants. Prospective students may contact faculty members directly to discuss their research interests and possible RA support.

Funding opportunities are competitive, merit-based and can range from a small stipend to a full assistantship with tuition assistance depending upon available funding. Students who intend to seek funding should apply for admission as a doctoral track student to be considered for university funding lines, as there are extremely limited funding opportunities for master’s students. Funding is always dependent upon budgets from year to year, is not guaranteed, and is also contingent upon adequate progression in coursework and academic standing as well as satisfactory performance of all job responsibilities and requirements. Funded students must abide by all pertinent UTD policies and procedures, including those pertaining to academic dishonesty.
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.

All PhD students are required to meet with their research advisor to discuss course selection and obtain approval on a registration form prior to registering every semester. Any subsequent schedule changes (add/swap/drop) must be submitted on a new registration form along with research advisor approval.

PhD students may register through the graduate program administrator by submitting a signed registration form in person or by emailing a complete registration request from their UTD email account. Email requests must contain the following information: course number and section, course title, 5-digit class number, semester of request, and research advisor approval. 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
Permission from the faculty member is required prior to registration in Advanced Research or Dissertation hours. Approval can be supplied on a paper registration form or through an email request.

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.

Full-time students: The drop deadline occurs after the last day to add a course to a schedule. If a student is required to maintain full-time status, the student should obtain approval from the department prior to dropping a course or making any changes to their schedule.
Degree Plan and Academic Standing

All students must have an approved degree plan on file. The purpose of this plan is to show how and when requirements will be met. The degree plan is a working document and may be updated regularly to reflect the student’s developing research focus and career goals.

Doctor of Philosophy in Mechanical Engineering Degree Plan Details

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Core Courses</td>
<td>12</td>
</tr>
<tr>
<td>Prescribed Electives</td>
<td>12</td>
</tr>
<tr>
<td>Math electives</td>
<td>6</td>
</tr>
<tr>
<td>Free Electives</td>
<td>12</td>
</tr>
<tr>
<td>Dissertation</td>
<td>6 (minimum)</td>
</tr>
<tr>
<td>Other: Research in Mechanical Engineering</td>
<td>30 (minimum)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>78 (minimum)</td>
</tr>
</tbody>
</table>

A PhD student in ME must complete a total of four core courses, selected from two or more of the four concentration areas below, receive a grade of B- or better in each of the core courses, and must maintain a minimum 3.0 GPA in their core courses.

Dynamic Systems and Control
MECH 6300 Linear Systems
MECH 6309 Intermediate Dynamics
MECH 6325 Optimal Estimation and Kalman Filter
MECH 6326 Optimal Control and Dynamic Programming

Manufacturing and Design Innovation
MECH 6303 Computer Aided Design
MECH 6318 Engineering Optimization
MECH 6333 Materials Design and Manufacturing

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
Doctor of Philosophy in Mechanical Engineering

**Prescribed Electives within Concentration Areas**
Students must complete at least four courses from the list of prescribed elective courses in one of the four areas of concentration. Courses counted towards satisfying the core requirement cannot be counted towards satisfying requirements on prescribed electives.

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

**Mathematics Electives**
Students must complete at least two approved mathematics courses in order to satisfy the mathematics elective portion of the degree plan.

**Approved Electives**
A PhD 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 PhD degree plan. Aside from the cross-listed courses in the prescribed elective section of the ME PhD degree plan, courses offered by the School of Management (OPRE, FIN, MKT, OB, etc.) will not be counted towards the ME PhD degree plan (this includes courses cross-listed with Systems Engineering (SYSM) and taught by SOM faculty). All electives must be approved by the PhD student’s research advisor.

Neither a MSME degree nor minor is required for the PhD. 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:** Due to the similarities of the MS and PhD degree plans, students will complete the MS degree requirements while working on the PhD degree plan requirements. 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 PhD are required to file the “Addition of Master’s degree for Doctoral Students” form at least two semesters prior to the semester in which they plan to graduate. Along with this request, students must submit an approved MS degree plan form to the graduate program administrator.
Graduate Transfer Credit Policies
A student may have up to thirty-three hours of graduate level coursework taken at another accredited university applied toward their PhD degree plan, upon approval. To qualify for transfer credit for any class, the grade earned in the course must be a B or better. Transfer decisions are made in consultation with the research advisor and the graduate committee.

All requests for transfer of credit should be approved by the student’s research advisor on the Transfer of Credit Request form (Appendix F), 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.

Submission Deadlines: Fall 2019 – October 4 Spring 2020 – March 6

Final transfer credit determinations will be awarded in accordance with the policies and procedures outlined in the Graduate Catalog after a review of official transcripts and course descriptions provided by the student.

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 PhD 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 Education.

Catalog Policy
Students are normally bound by the requirements of the catalog in force at the time of their first registration; students may choose, however, to fulfill the requirements of a subsequent catalog with the permission of their department. Students may choose the catalog in effect in any year in which they are enrolled in their graduate program. This regulation applies only to the specific coursework and the number of semester credit hours required for the academic degree.

All requests for changes to a student’s catalog year must be approved by the Associate Department Head of the Mechanical Engineering program by submission of the Change of Catalog Year Form.
Academic Standing
Registration in the graduate programs beyond the first semester 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 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.

While on academic probation, students will not be permitted to register in courses until the current semester grades have posted and the student has received permission from their research advisor on a registration form. The student will also need to meet with the graduate program administrator at the end of each semester they are on probation, prior to registration, until the student has successfully raised their GPA to a 3.0 or better.

Graduate Grading and Grade Point Average
The following grading scale is used in all Graduate coursework at the University:

<table>
<thead>
<tr>
<th>GRADE</th>
<th>GRADE POINTS PER SEMESTER HOUR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>A-</td>
<td>3.67</td>
<td></td>
</tr>
<tr>
<td>B+</td>
<td>3.33</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>B-</td>
<td>2.67</td>
<td></td>
</tr>
<tr>
<td>C+</td>
<td>2.33</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>0.00</td>
<td>Failure of either a Pass/Fail or Graded Course</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>Grades of I, P, &amp; W do not produce grade points</td>
</tr>
<tr>
<td>P</td>
<td>Pass</td>
<td>Grades of I, P, &amp; W do not produce grade points</td>
</tr>
<tr>
<td>W</td>
<td>Withdraw</td>
<td>Grades of I, P, &amp; W do not produce grade points</td>
</tr>
</tbody>
</table>
Doctor of Philosophy in Mechanical Engineering

Doctoral Program Requirements

In addition to degree plan requirements, PhD students are required to complete the following:

- Qualifying Exam (QE): the QE is to be taken within three long semesters of entering the doctoral program. The exam is offered twice a year, in the fall and spring semesters.
- Comprehensive exam (CE): this exam consists of both a written document and oral presentation of the student’s proposed dissertation research.
- Final Exam: completion of a major research project culminating in a dissertation demonstrating an original contribution to scientific knowledge and engineering practice.

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.

<table>
<thead>
<tr>
<th>Milestone Timeline</th>
<th>Sem 1</th>
<th>Sem 2</th>
</tr>
</thead>
</table>
| **First Year**     | o Select Faculty Advisor  
|                    | o Register in MECH 7392 Adv Math for Mechanical Engineers I 
|                    | o Complete Transfer of Credit Request form (if applicable)  
|                    | o Milestone Agreement Form | o Register in MECH 7393 Adv Math for Mechanical Engineers II  
|                    |                               | o Doctoral Progress Report (due every Spring)  
|                    |                               | o Research Area Focused |
| **Second Year**    | o Qualifying Exam  
|                    | o File official Degree Plan | o Dissertation Committee Approved |
| **Third or Fourth Year** | o Draft proposal (CE) and submit to committee  
|                    | o Comprehensive Exam completed | |
| **Fifth Year**     | o Final draft of Dissertation submitted to committee  
|                    | o Dissertation defense successfully completed | |

Milestones Agreement Form

The Milestones Agreement Form defines the specific requirements of the mechanical engineering doctoral program and encourages an annual review between the student and research advisor to ensure adequate progress is made throughout the program. The student and their research advisor will review and sign this form in the first semester and at the end of each subsequent academic year to be filed in the mechanical engineering department office. Students who fall behind risk loss of assistantship support or dismissal from the PhD program.
Qualifying Examination

Students are required to sit for the mechanical engineering qualifying exam (QE) within three long semesters after entering the program, or prior to completing twenty-seven credit hours in the program. Credit hours transferred from another university will count towards the twenty-seven credit hour requirement. Students must declare their intent to take the QE by submitting an “Application for Doctoral Qualifying Exam” form to the graduate program administrator within the first three weeks of the semester they intend to sit for the exam. Students must have an official degree plan on file and 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 exam. Students 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 QE 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 the QE. The exam takes place over two days. On each of these two days, a three-hour written exam is given in one continuous sitting. Students are not to bring any outside materials to the exam (no books or notes). The questions are prepared by concentration area committees and an ad-hoc math committee. The exam will be graded, and feedback provided to the students 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 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. 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.

Upon successful completion of the Qualifying Examination in a selected concentration area, the student will no longer be eligible to change their concentration area on the PhD degree plan.

Qualifying Exam Timeline

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3</td>
<td>Application due with identification of chosen concentration area</td>
</tr>
<tr>
<td>11</td>
<td>Written exams (March/November)</td>
</tr>
<tr>
<td>13</td>
<td>Announcement of QE results</td>
</tr>
</tbody>
</table>
Doctor of Philosophy in Mechanical Engineering

Doctoral Candidacy and Dissertation

Doctoral Candidacy
Students will enter into doctoral candidacy upon successful completion of the Qualifying Examination, completion of 30 semester credit hours of graduate coursework, maintaining good academic standing, and the assignment of an approved supervising committee.

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 three of the committee members must be mechanical engineering faculty. 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 Education 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.

Comprehensive Exam/Dissertation Proposal
The comprehensive exam is used to determine if the student has the necessary background and skills required for dissertation research and if the student can organize and conduct the research independently. Students must have an approved supervising committee on file with the department office and must be registered in at least three semester credit hours of graduate coursework during the semester in which he or she intends to complete the oral exam. A student should verify these minimum requirements and ensure they are in good standing at the university prior to declaring their intent to complete the examination.

The student must set the exam date with the agreement of the committee members and file the “Request for Comprehensive Examination” form (Appendix K) with the graduate program administrator at least two weeks prior to the exam date. A written proposal should also be provided to the supervising committee at least two weeks before the oral exam date. The presentation is followed by an oral exam 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 (Appendix L). 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 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 in order to graduate. The rules for this defense are specified by the Office of the Dean of Graduate Education. 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 "Checklist for Final Submission of Doctoral Dissertation." The student must file the Request for Final Oral Examination form with the Office of Graduate Education at least 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 full-time the following semester in order to finish. This is applicable to all doctoral students.
Career Advising

In addition to guidance from the Research Advisor, career advising and job search resources are available to mechanical engineering students through the UT Dallas Career Center and Office of Graduate Education.

The Engineering and Computer Science Career Consultant in the UT Dallas Career Center provides 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.

The Office of Graduate Education’s Graduate Career Services office provides resources to help graduate students prepare, plan, and execute their job search. Their office offers numerous workshops throughout the year on topics such as career planning, skill building, individual development plans, and career exploration.

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 Education website and the University Registrar’s website for these deadlines and fees.

All graduate students have 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.

Students must apply for graduation by the posted deadline through their Galaxy account.
APPENDIX A

Acknowledgment of Policies Form
Acknowledgment of Policies Form - PhD

**All students must complete, sign, and date this form upon entrance to the Graduate ME Department**

Legal Name (Last, First):

Preferred Name:

UTD ID Number:

Program Start (semester & year):

By initialing each item below, I confirm that I have read and understand the following policies of The University of Texas at Dallas and the Graduate Mechanical Engineering Department:

____ I must complete all **assigned prerequisites** unless it has been officially waived by the department or is not a requirement of my degree plan.

____ I must meet with my **Faculty Advisor** at least once a year to be advised and complete the Annual Doctoral Progress Report.

____ I understand that, in the event that I do not have a **Faculty Advisor**, I will be given no more than one semester to locate a Faculty Advisor before being dismissed.

____ I understand that all **registration** requests must be approved by a Faculty Advisor.

____ I understand that I must sit for the **Qualifying Exam** within three long semesters.

____ There is a **10-year time limit** to complete all PhD coursework.

____ **Fall/Spring** enrollment is limited to 9SCH and **Summer** enrollment is limited to 6SCH.


____ I must have a **core GPA ≥ 3.0** and a **cumulative GPA ≥ 3.0** to graduate.

____ I understand that all **transfer of credit** requests must be submitted within the first year of enrollment in the program.

____ I know a course may be **repeated** one time and I can repeat no more than three courses.

____ I must make up any **incomplete (I)** grades by the deadline or it will turn into an **F** on my transcript.

____ I understand I must add the correct **Master’s** program 2 semesters before I intend to graduate with my Master’s degree.

____ I know I **cannot** enroll in courses while on **Academic Probation** until the current semester grades are posted and I have permission from my Faculty Advisor.

__________________________     ____/____/______
Student Signature                                                  Date
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

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Expected Time of Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review of Student’s Progress with (advisor, Doctoral studies committee)</td>
<td>Annually</td>
</tr>
<tr>
<td>Successful completion of oral and/or written qualifying exam</td>
<td>Within 3 long semesters</td>
</tr>
<tr>
<td>Relevant Coursework Successfully Completed</td>
<td>99SCH</td>
</tr>
<tr>
<td>Dissertation Committee Appointed and Approved</td>
<td>Within 50SCH</td>
</tr>
<tr>
<td>Research Protocols and/or IRB Approval (as applicable)</td>
<td>99SCH</td>
</tr>
<tr>
<td>Dissertation Proposal Completed and Approved</td>
<td>99SCH</td>
</tr>
<tr>
<td>Dissertation Completed and Approved by Committee</td>
<td>99SCH</td>
</tr>
<tr>
<td>Dissertation Accepted by Graduate School</td>
<td>99SCH</td>
</tr>
<tr>
<td>Exit Interview Completed and Submitted To SED</td>
<td>99SCH</td>
</tr>
</tbody>
</table>

**Status/Progress of student’s research for fall 2019 – spring 2020 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)

________________________

________________________

________________________

________________________

How is the student currently supported?
___________________________________ TA □  RA □  Self-supported □

___________________________________ How many doctoral hours will student have

___________________________________

Print Student Name                  UTD ID #
___________________________________

Student’s Signature                  Date
___________________________________

Print Advisor Name
___________________________________

Advisor’s Signature                  Date
APPENDIX C

Mechanical Engineering PhD Degree Plan (Catalog 2017)

Students entering in Fall 2017, Spring 2018, and Summer 2018 will follow these degree plans.
### Dynamic Systems & Controls (DSC) Programs

**Core GPA:**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6314</td>
<td>Engineering Systems: Modeling &amp; Simulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Manufacturing & Design Innovation**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mechanics & Materials**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Thermal & Fluid Sciences**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS** **Must earn B- or better & core GPA of 3.0 or better**:

**MECH 6300 Linear Systems**  
**MECH 6308 Haptics & Teleoperated Systems**  
**MECH 6309 Int. Dynamics**  
**MECH 6311 Adv. Mechanical Vibrations**  
**MECH 6312 Random Processes**  
**MECH 6313 Nonlinear Systems**  
**MECH 6314 Eng. Systems: Modeling & Simulation**  
**MECH 6316 Digital Control of Automotive Powertrain Systems**  
**MECH 6317 Dynamics of Complex Networks & Systems**  
**MECH 6318 Engineering Optimization**  
**MECH 6319 Dynamics & Controls of MEMS**  
**MECH 6323 Robust Control Systems**  
**MECH 6324 Robot Control**  
**MECH 6325 Optimal Estimation & Kalman Filter**  
**MECH 6326 Optimal Control & Dynamic Programming**  
**MECH 6327 Convex Optimization**  
**MECH 6328 Frequency-Domain Analysis & Design of Control Systems**  
**MECH 6V29 Special Topics in DSC**  
**MECH 7V29 Advanced Special Topics in DSC**

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT** **(6 hrs):**

**MECH 6391 Computational Methods in Engineering**  
**MECH 7392 Advanced Mathematics for Mechanical Engineers I**  
**MECH 7393 Advanced Mathematics for Mechanical Engineers II**  
**MATH 6303 Theory of Complex Functions I**  
**MATH 6308 Inverse Problems & Applications**  
**MATH 6313 Numerical Analysis**  
**MATH 6315 Ordinary Differential Equations**  
**MATH 6318 Numerical Analysis of Differential Equations**  
**MATH 6319-20 Principles & Techniques in Applied Math I & II**  
**MATH 6321 Optimization**  
**MATH 6340 Numerical Linear Algebra**  
**MATH 7313 Partial Differential Equations I**  
**STAT 6331 Statistical Inference I**  
**STAT 6337-8 Advanced Statistical Methods I & II**  
**STAT 6339 Linear Statistical Models**  
**STAT 6341 Numerical Linear Algebra & Statistical Computing**

**COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES ´FREE ELECTIVES´** **(48 hrs):**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total SCH** **(min.78)**

**APPROVALS**

**SIGNATURE**

Student

Faculty Advisor

Assoc. Dept. Head

Rev. 6/17
## DOCTOR OF PHILOSOPHY IN MECHANICAL ENGINEERING

### Manufacturing & Design Innovation (MDI)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6314</td>
<td>Engineering Systems: Modeling &amp; Simulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6314</td>
<td>Engineering Systems: Modeling &amp; Simulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS **Must earn B- or better & core GPA of 3.0 or better**:**

### Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6314</td>
<td>Engineering Systems: Modeling &amp; Simulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Core GPA:**

**COMPLETE FOUR COURSES FROM THE FOLLOWING (12 hrs):**

MECH 6311 Adv. Mechanical Vibrations  
MECH 6314 Eng. Systems: Modeling & Simulation  
MECH 6317 Dynamics of Complex Networks & Systems  
MECH 6318 Eng. Optimization  
MECH 6319 Dynamics & Controls of MEMS  
MECH 6330 Multiscale Design & Optimization  
MECH 6333 Materials Design & Manufacturing  
MECH 6334 Smart Materials & Structures  
MECH 6335 Flexible Manufacturing Strategies  
MECH 6337 Systems Engineering, Architecture & Design  
MECH 6338 Reliability-Based Design  
MECH 6339 Multidisciplinary Design Optimization  
MECH 6341 Lithography & Nanofabrication  
MECH 6347 Introduction to MEMS  
MECH 6348 Semiconductor Processing Technology  
MECH 6353 Computational Mechanics  
MECH 6354 Experimental Mechanics  
MECH 6V49 Special Topics in MDI  
MECH 7V49 Advanced Special Topics in MDI

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**

MECH 6391 Computational Methods in Engineering  
MECH 7392 Advanced Mathematics for Mechanical Engineers I  
MECH 7393 Advanced Mathematics for Mechanical Engineers II  
MATH 6303 Theory of Complex Functions I  
MATH 6308 Inverse Problems & Applications  
MATH 6313 Numerical Analysis  
MATH 6315 Ordinary Differential Equations  
MATH 6318 Numerical Analysis of Differential Equations  
MATH 6319-20 Principles & Techniques in Applied Math I & II  
MATH 6321 Optimization  
MATH 6340 Numerical Linear Algebra  
MATH 7313 Partial Differential Equations I  
STAT 6331 Statistical Inference I  
STAT 6337-8 Advanced Statistical Methods I & II  
STAT 6339 Linear Statistical Models  
STAT 6341 Numerical Linear Algebra & Statistical Computing

**COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES "FREE ELECTIVES" (48 hrs):**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total SCH** (min.78)

**APPROVALS**

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td></td>
</tr>
<tr>
<td>Faculty Advisor</td>
<td></td>
</tr>
<tr>
<td>Assoc. Dept. Head</td>
<td></td>
</tr>
</tbody>
</table>

**Rev. 6/17**
### Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6314</td>
<td>Engineering Systems: Modeling &amp; Simulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Core GPA: ___

**COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS **Must earn B- or better & core GPA of 3.0 or better**:

**MECHANICS & MATERIALS (MM)**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Thermal & Fluid Sciences**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COMPLETE FOUR COURSES FROM THE FOLLOWING (12 hrs):**

- MECH 6306 Continuum Mechanics
- MECH 6350 Advanced Solid Mechanics
- MECH 6351 Finite Element Techniques
- MECH 6353 Computational Mechanics
- MECH 6354 Experimental Mechanics
- MECH 6355 Viscoelasticity
- MECH 6356 Fracture Mechanics
- MECH 6367 Mechanical Properties of Materials
- MECH 6368 Imperfections in Solids
- MECH 6V69 Special Topics in MM
- MECH 7V69 Advanced Special Topics in MM

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**

- MECH 6391 Computational Methods in Engineering
- MECH 7392 Advanced Mathematics for Mechanical Engineers
- MECH 7393 Advanced Mathematics for Mechanical Engineers II
- MATH 6303 Theory of Complex Functions
- MATH 6308 Inverse Problems & Applications
- MATH 6313 Numerical Analysis
- MATH 6315 Ordinary Differential Equations
- MATH 6318 Numerical Analysis of Differential Equations
- MATH 6319-20 Principles & Techniques in Applied Math I & II
- MATH 6321 Optimization
- MATH 6340 Numerical Linear Algebra
- MATH 7313 Partial Differential Equations
- STAT 6331 Statistical Inference
- STAT 6337-8 Advanced Statistical Methods I & II
- STAT 6339 Linear Statistical Models
- STAT 6341 Numerical Linear Algebra & Statistical Computing

**COMPLETE FOUR Approved Graduate Level Courses "FREE ELECTIVES" (48 hrs):**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total SCH (min.78)

**APPROVALS**

**SIGNATURE**

**DATE**

Student

Faculty Advisor

Assoc. Dept. Head

Rev. 6/17
DOCTOR OF PHILOSOPHY IN MECHANICAL ENGINEERING  
Thermal & Fluid Sciences (TFS)

<table>
<thead>
<tr>
<th>Name</th>
<th>UTD ID</th>
</tr>
</thead>
</table>

**COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS** **Must earn B- or better & core GPA of 3.0 or better**:

### Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6314</td>
<td>Engineering Systems: Modeling &amp; Simulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Conductive Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Core GPA:** [ ]

**COMPLETE FOUR COURSES FROM THE FOLLOWING (12 hrs):**

- MECH 6370 Incompressible Fluid Mechanics
- MECH 6371 Computational Fluid Dynamics
- MECH 6372 Turbulent Flows
- MECH 6373 Convective Heat Transfer
- MECH 6374 Conductive & Radiative Heat Transfer
- MECH 6375 Boiling Heat Transfer & Two-Phase Flow
- MECH 6376 Experimental Thermal & Fluid Dynamics
- MECH 6377 Advanced Thermodynamics
- MECH 6383 Plasma Science
- MECH 6v89 Special Topics in TFS
- MECH 7v89 Advanced Special Topics in TFS

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**

- MECH 6391 Computational Methods in Engineering
- MECH 7392 Advanced Mathematics for Mechanical Engineers
- MECH 7393 Advanced Mathematics for Mechanical Engineers II
- MATH 6303 Theory of Complex Functions
- MATH 6308 Inverse Problems & Applications
- MATH 6313 Numerical Analysis
- MATH 6315 Ordinary Differential Equations
- MATH 6318 Numerical Analysis of Differential Equations
- MATH 6319-20 Principles & Techniques in Applied Math I & II
- MATH 6321 Optimization
- MATH 6340 Numerical Linear Algebra
- MATH 7313 Partial Differential Equations
- STAT 6331 Statistical Inference
- STAT 6337-8 Advanced Statistical Methods I & II
- STAT 6339 Linear Statistical Models
- STAT 6341 Numerical Linear Algebra & Statistical Computing

**COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES "FREE ELECTIVES" (48 hrs):**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total SCH (min.78)**

**APPROVALS**

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td></td>
</tr>
<tr>
<td>Faculty Advisor</td>
<td></td>
</tr>
<tr>
<td>Assoc. Dept. Head</td>
<td></td>
</tr>
</tbody>
</table>

**Rev. 6/17**
APPENDIX D

Mechanical Engineering PhD Degree Plan (Catalog 2018)

Students entering Fall 2018, Spring 2019, and Summer 2019 will follow these degree plans.
## Dynamic Systems & Controls (DSC)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation and Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CORE GPA:**

**COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS** **Must earn B- or better & core GPA of 3.0 or better**:  
Dynamic Systems & Controls  
Manufacturing & Design Innovation  
Mechanics & Materials  
Thermal & Fluid Sciences

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**

- MECH 6391 Computational Methods in Engineering  
- MECH 7392 Advanced Mathematics for Mechanical Engineers I  
- MECH 7393 Advanced Mathematics for Mechanical Engineers II  
- MATH 6303 Theory of Complex Functions I  
- MATH 6308 Inverse Problems & Applications  
- MATH 6313 Numerical Analysis  
- MATH 6315 Ordinary Differential Equations  
- MATH 6318 Numerical Analysis of Differential Equations  
- MATH 6319-20 Principles & Techniques in Applied Math I & II  
- MATH 6320 Optimization  
- MATH 6340 Numerical Linear Algebra  
- MATH 7313 Partial Differential Equations I  
- STAT 6331 Statistical Inference I  
- STAT 6337-8 Advanced Statistical Methods I & II  
- STAT 6339 Linear Statistical Models  
- STAT 6341 Numerical Linear Algebra & Statistical Computing

**COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES "FREE ELECTIVES" (48 hrs):**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**APPROVALS**

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td></td>
</tr>
<tr>
<td>Faculty Advisor</td>
<td></td>
</tr>
<tr>
<td>Assoc. Dept. Head</td>
<td></td>
</tr>
</tbody>
</table>

**REV. 8/18**
DOCTOR OF PHILOSOPHY IN MECHANICAL ENGINEERING
Manufacturing & Design Innovation (MDI)

COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS **Must earn B- or better & core GPA of 3.0 or better**:  

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation and Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6311</td>
<td>Adv. Mechanical Vibrations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6314</td>
<td>Eng. Systems: Modeling &amp; Simulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6317</td>
<td>Dynamics of Complex Networks &amp; Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6319</td>
<td>Dynamics &amp; Controls of MEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6330</td>
<td>Multiscale Design &amp; Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6334</td>
<td>Smart Materials &amp; Structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6335</td>
<td>Flexible Manufacturing Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6337</td>
<td>Systems Engineering, Architecture &amp; Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6338</td>
<td>Reliability-Based Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6339</td>
<td>Multidisciplinary Design Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6341</td>
<td>Lithography &amp; Nanofabrication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6342</td>
<td>Renewable Energy Syst. Design &amp; Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6347</td>
<td>Introduction to MEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6348</td>
<td>Semiconductor Processing Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6349</td>
<td>Computational Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6354</td>
<td>Experimental Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6V49</td>
<td>Special Topics in MDI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 7V49</td>
<td>Advanced Special Topics in MDI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMPLETE TWO COURSES FROM THE FOLLOWING (12 hrs):


COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES "FREE ELECTIVES" (48 hrs):

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Core GPA: [Blank]

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

COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):


<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total SCH (min. 78)

APPROVALS

<table>
<thead>
<tr>
<th>Student</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Advisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assoc. Dept. Head</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rev. 8/18
## Complete Four Core Courses from at Least Two Areas **Must earn B- or better & Core GPA of 3.0 or better**: 

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation and Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation and Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Complete Four Courses from the Following (12 hrs):


## Complete Two Courses from the List Below to Satisfy the Mathematics Elective Requirement (6 hrs):


## Complete Four Approved Graduate Level Courses "Free Electives" (48 hrs):

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total SCH (min. 78)**

## Approvals

Student ____________________________  
Faculty Advisor ____________________________  
Assoc. Dept. Head ____________________________

**Rev. 8/18**
### Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation and Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Complete Four Core Courses from at least Two Areas **Must earn B- or better & core GPA of 3.0 or better**:

**Core GPA: **

### COMPLETE FOUR COURSES FROM THE FOLLOWING (12 hrs):

- MECH 6370 Incompressible Fluid Mechanics
- MECH 6371 Computational Fluid Dynamics
- MECH 6372 Turbulent Flows
- MECH 6373 Convective Heat Transfer
- MECH 6374 Conductive & Radiative Heat Transfer
- MECH 6375 Boiling Heat Transfer & Two-Phase Flow
- MECH 6376 Experimental Thermal & Fluid Dynamics
- MECH 6377 Advanced Thermodynamics
- MECH 6383 Plasma Science
- MECH 6V89 Special Topics in TFS
- MECH 7V89 Advanced Special Topics in TFS

### COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):

- MECH 6391 Computational Methods in Engineering
- MECH 7392 Advanced Mathematics for Mechanical Engineers
- MECH 7393 Advanced Mathematics for Mechanical Engineers II
- MATH 6303 Theory of Complex Functions
- MATH 6308 Inverse Problems & Applications
- MATH 6313 Numerical Analysis
- MATH 6315 Ordinary Differential Equations
- MATH 6318 Numerical Analysis of Differential Equations
- MATH 6319-20 Principles & Techniques in Applied Math I & II
- MATH 6321 Optimization
- MATH 6340 Numerical Linear Algebra
- MATH 7313 Partial Differential Equations
- STAT 6331 Statistical Inference
- STAT 6337-8 Advanced Statistical Methods I & II
- STAT 6339 Linear Statistical Models
- STAT 6341 Numerical Linear Algebra & Statistical Computing

### COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES "FREE ELECTIVES" (48 hrs):

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total SCH: **

**Approval Date**

<table>
<thead>
<tr>
<th>Student</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Advisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assoc. Dept. Head</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rev. 8/18**
Doctor of Philosophy in Mechanical Engineering

APPENDIX E

Mechanical Engineering PhD Degree Plan (Catalog 2019)

Students entering Fall 2019 and beyond will follow these degree plans. Students that entered in prior semesters can update their catalog year to follow these degree requirements by submitting a Change of Catalog Form. Students can only move their catalog year forward.
DOCTOR OF PHILOSOPHY IN MECHANICAL ENGINEERING  
Dynamic Systems & Controls (DSC)

<table>
<thead>
<tr>
<th>Name</th>
<th>UTD ID</th>
</tr>
</thead>
</table>

**COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS** **Must earn B- or better & core GPA of 3.0 or better**:  
Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6309</td>
<td>Intermediate Dynamics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation &amp; Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Optimal Control &amp; Dynamic Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Core GPA: 

**COMPLETE FOUR COURSES FROM THE FOLLOWING (12 hrs):**


**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**


**COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES "FREE ELECTIVES" (48 hrs):**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total SCH (min.78)

<table>
<thead>
<tr>
<th>APPROVALS</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty Advisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assoc. Dept. Head</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rev. 8/19
DOCTOR OF PHILOSOPHY IN MECHANICAL ENGINEERING
Manufacturing & Design Innovation (MDI)

Name ___________________________  UTD ID ___________

COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS **Must earn B- or better & core GPA of 3.0 or better**:  

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6309</td>
<td>Intermediate Dynamics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation &amp; Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6326</td>
<td>Optimal Control &amp; Dynamic Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMPLETE FOUR CORE COURSES FROM THE FOLLOWING (12 hrs):

- MECH 6303 Computer Aided Design
- MECH 6311 Adv. Mechanical Vibrations
- MECH 6314 Eng. Systems: Modeling & Simulation
- MECH 6317 Dynamics of Complex Networks & Systems
- MECH 6318 Eng. Optimization
- MECH 6319 Dynamics & Controls of MEMS
- MECH 6330 Multiscale Design & Optimization
- MECH 6333 Materials Design & Manufacturing
- MECH 6334 Smart Materials & Structures
- MECH 6335 Flexible Manufacturing Strategies
- MECH 6337 Systems Engineering, Architecture & Design
- MECH 6338 Reliability-Based Design
- MECH 6339 Multidisciplinary Design Optimization
- MECH 6341 Lithography & Nanofabrication
- MECH 6342 Renewable Energy & Grid Integration
- MECH 6347 Introduction to MEMS
- MECH 6348 Semiconductor Processing Tech.
- MECH 6353 Computational Mechanics
- MECH 6354 Experimental Mechanics
- MECH 6V49 Special Topics in MDI
- MECH 7V49 Advanced Special Topics in MDI

COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):

- MECH 6391 Computational Methods in Engineering
- MECH 7392 Advanced Mathematics for Mechanical Engineers I
- MECH 7393 Advanced Mathematics for Mechanical Engineers II
- MATH 6303 Theory of Complex Functions I
- MATH 6308 Inverse Problems & Applications
- MATH 6313 Numerical Analysis
- MATH 6315 Ordinary Differential Equations
- MATH 6318 Numerical Analysis of Differential Equations
- MATH 6319-20 Principles & Techniques in Applied Math I & II
- MATH 6321 Optimization
- MATH 6340 Numerical Linear Algebra
- MATH 7313 Partial Differential Equations I
- STAT 6331 Statistical Inference I
- STAT 6337-8 Advanced Statistical Methods I & II
- STAT 6339 Linear Statistical Models
- STAT 6341 Numerical Linear Algebra & Statistical Computing

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

COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES "FREE ELECTIVES" (48 hrs):

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total SCH (min.78)

APPROVALS

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td></td>
</tr>
<tr>
<td>Faculty Advisor</td>
<td></td>
</tr>
<tr>
<td>Assoc. Dept. Head</td>
<td></td>
</tr>
</tbody>
</table>

Rev. 8/19
**DOCTOR OF PHILOSOPHY IN MECHANICAL ENGINEERING**

**Mechanics & Materials (MM)**

- **Name**
- **UTD ID**

**COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS** **Must earn B- or better & core GPA of 3.0 or better**:

### Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6309</td>
<td>Intermediate Dynamics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation &amp; Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6326</td>
<td>Optimal Control &amp; Dynamic Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Core GPA:**

**COMPLETE FOUR COURSES FROM THE FOLLOWING (12 hrs):**

- MECH 6306 Continuum Mechanics
- MECH 6350 Advanced Solid Mechanics
- MECH 6351 Finite Element Techniques
- MECH 6353 Computational Mechanics
- MECH 6354 Experimental Mechanics
- MECH 6355 Viscoelasticity
- MECH 6356 Fracture Mechanics
- MECH 6357 Phase Transformations & Kinetic Processes in Materials
- MECH 6358 Adv. Ceramic Materials
- MECH 6359 Modern Physical Metallurgy
- MECH 6367 Mechanical Properties of Materials
- MECH 6368 Imperfections in Crystalline Solids
- MECH 6V69 Special Topics in MM
- MECH 7V69 Advanced Special Topics in MM

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**

- MECH 6391 Computational Methods in Engineering
- MECH 7392 Advanced Mathematics for Mechanical Engineers
- MECH 7393 Advanced Mathematics for Mechanical Engineers II
- MATH 6303 Theory of Complex Functions
- MATH 6308 Inverse Problems & Applications
- MATH 6313 Numerical Analysis
- MATH 6315 Ordinary Differential Equations
- MATH 6318 Numerical Analysis of Differential Equations
- MATH 6319-20 Principles & Techniques in Applied Math I & II
- MATH 6321 Optimization
- MATH 6340 Numerical Linear Algebra
- MATH 7313 Partial Differential Equations
- STAT 6331 Statistical Inference
- STAT 6337-8 Advanced Statistical Methods I & II
- STAT 6339 Linear Statistical Models
- STAT 6341 Numerical Linear Algebra & Statistical Computing

**COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES "FREE ELECTIVES" (48 hrs):**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total SCH (min.78)**

**APPROVALS**

<table>
<thead>
<tr>
<th>Student</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Advisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assoc. Dept. Head</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rev. 8/19**
## Dynamic Systems & Controls

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6309</td>
<td>Intermediate Dynamics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation &amp; Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6326</td>
<td>Optimal Control &amp; Dynamic Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Manufacturing & Design Innovation

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Mechanics & Materials

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Thermal & Fluid Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Core GPA: [Box]

**COMPLETE FOUR CORE COURSES FROM AT LEAST TWO AREAS **Must earn B- or better & core GPA of 3.0 or better**:

**Dynamic Systems & Controls**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6300</td>
<td>Linear Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6309</td>
<td>Intermediate Dynamics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6325</td>
<td>Optimal Estimation &amp; Kalman Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6326</td>
<td>Optimal Control &amp; Dynamic Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Manufacturing & Design Innovation**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6303</td>
<td>Computer Aided Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6318</td>
<td>Engineering Optimization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6333</td>
<td>Materials Design &amp; Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mechanics & Materials**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6306</td>
<td>Continuum Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6350</td>
<td>Advanced Solid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Thermal & Fluid Sciences**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 6370</td>
<td>Incompressible Fluid Mechanics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6373</td>
<td>Convective Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 6374</td>
<td>Conductive &amp; Radiative Heat Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Core GPA: [Box]

**COMPLETE FOUR COURSES FROM THE FOLLOWING (12 hrs):**

- MECH 6370 Incompressible Fluid Mechanics
- MECH 6371 Computational Thermal Fluid Science
- MECH 6372 Turbulent Flows
- MECH 6373 Convective Heat Transfer
- MECH 6374 Conductive & Radiative Heat Transfer
- MECH 6375 Phase Change Heat Transfer
- MECH 6376 Experimental Thermal & Fluid Dynamics
- MECH 6377 Advanced Thermodynamics
- MECH 6378 Intro to Compressible Fluid Mechanics
- MECH 6383 Plasma Science
- MECH 6V89 Special Topics in TFS
- MECH 7V89 Advanced Special Topics in TFS

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**

- MATH 6301 Computational Methods in Engineering
- MECH 7392 Advanced Mathematics for Mechanical Engineers
- MECH 7393 Advanced Mathematics for Mechanical Engineers II
- MATH 6303 Theory of Complex Functions I
- MATH 6308 Inverse Problems & Applications
- MATH 6313 Numerical Analysis
- MATH 6315 Ordinary Differential Equations
- MATH 6318 Numerical Analysis of Differential Equations
- MATH 6319-20 Principles & Techniques in Applied Math I & II
- MATH 6321 Optimization
- MATH 6340 Numerical Linear Algebra
- MATH 7313 Partial Differential Equations I
- STAT 6331 Statistical Inference I
- STAT 6337-8 Advanced Statistical Methods I & II
- STAT 6339 Linear Statistical Models
- STAT 6341 Numerical Linear Algebra & Statistical Computing

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**

- MATH 6301 Computational Methods in Engineering
- MECH 7392 Advanced Mathematics for Mechanical Engineers
- MECH 7393 Advanced Mathematics for Mechanical Engineers II
- MATH 6303 Theory of Complex Functions I
- MATH 6308 Inverse Problems & Applications
- MATH 6313 Numerical Analysis
- MATH 6315 Ordinary Differential Equations
- MATH 6318 Numerical Analysis of Differential Equations
- MATH 6319-20 Principles & Techniques in Applied Math I & II
- MATH 6321 Optimization
- MATH 6340 Numerical Linear Algebra
- MATH 7313 Partial Differential Equations I
- STAT 6331 Statistical Inference I
- STAT 6337-8 Advanced Statistical Methods I & II
- STAT 6339 Linear Statistical Models
- STAT 6341 Numerical Linear Algebra & Statistical Computing

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**

- MATH 6301 Computational Methods in Engineering
- MECH 7392 Advanced Mathematics for Mechanical Engineers
- MECH 7393 Advanced Mathematics for Mechanical Engineers II
- MATH 6303 Theory of Complex Functions I
- MATH 6308 Inverse Problems & Applications
- MATH 6313 Numerical Analysis
- MATH 6315 Ordinary Differential Equations
- MATH 6318 Numerical Analysis of Differential Equations
- MATH 6319-20 Principles & Techniques in Applied Math I & II
- MATH 6321 Optimization
- MATH 6340 Numerical Linear Algebra
- MATH 7313 Partial Differential Equations I
- STAT 6331 Statistical Inference I
- STAT 6337-8 Advanced Statistical Methods I & II
- STAT 6339 Linear Statistical Models
- STAT 6341 Numerical Linear Algebra & Statistical Computing

**COMPLETE TWO COURSES FROM THE LIST BELOW TO SATISFY THE MATHEMATICS ELECTIVE REQUIREMENT (6 hrs):**

- MATH 6301 Computational Methods in Engineering
- MECH 7392 Advanced Mathematics for Mechanical Engineers
- MECH 7393 Advanced Mathematics for Mechanical Engineers II
- MATH 6303 Theory of Complex Functions I
- MATH 6308 Inverse Problems & Applications
- MATH 6313 Numerical Analysis
- MATH 6315 Ordinary Differential Equations
- MATH 6318 Numerical Analysis of Differential Equations
- MATH 6319-20 Principles & Techniques in Applied Math I & II
- MATH 6321 Optimization
- MATH 6340 Numerical Linear Algebra
- MATH 7313 Partial Differential Equations I
- STAT 6331 Statistical Inference I
- STAT 6337-8 Advanced Statistical Methods I & II
- STAT 6339 Linear Statistical Models
- STAT 6341 Numerical Linear Algebra & Statistical Computing

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

**COMPLETE FOUR APPROVED GRADUATE LEVEL COURSES "FREE ELECTIVES" (48 hrs):**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester</th>
<th>Transfer?</th>
<th>Approval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 8v70</td>
<td>Advanced Research (30 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECH 8v99</td>
<td>Dissertation (6 hrs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total SCH (min.78)**

**APPROVALS**

<table>
<thead>
<tr>
<th>Student</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty Advisor</td>
<td>Signature</td>
<td>Date</td>
</tr>
<tr>
<td>Assoc. Dept. Head</td>
<td>Signature</td>
<td>Date</td>
</tr>
</tbody>
</table>

**Rev. 8/19**
APPENDIX F

PhD Transfer of Credit Request Form
TRANSFER OF CREDIT REQUEST – MS to PHD

This form is only for Mechanical Engineering PhD students that have already completed and been awarded a MS degree at another university. PhD students that have not been awarded an MS degree should use the general “Transfer of Credit Request” form. 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 ____________________________________________ PhD degree at UTD.

Concentration Area: ___________________________ Program Start (Semester/Year): __________________________

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 8 years old for students whose master’s degrees are accepted for full credit; or more than 10 years old for doctoral degrees.

Course(s) the student is submitting to replace the Mechanical Engineering degree requirements:

<table>
<thead>
<tr>
<th>UTD Course #</th>
<th>UTD Course Title</th>
<th>T-Course #</th>
<th>T-Course Title</th>
<th>Institution</th>
<th>Grade</th>
<th>Date Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 33 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 8 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 G

Committee Appointment Form
COMMITTEE APPOINTMENT
GRADUATE PROGRAM

Doctoral degree _______ Master’s degree _______

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

I understand the membership of this committee cannot be changed for scheduling reasons, but only in the case of serious extenuating circumstances.

________________________ __________________________
Student signature date
APPENDIX H

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


References:


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:


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:


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:

Concentration Area: Manufacturing and Design Innovations (MDI)

**Engineering Optimization:** Basics of design optimization theory, numerical algorithms, and applications in engineering, linear programming, necessary and sufficient conditions, nonlinear programming with no constraints, nonlinear programming with constraints, multi-objective optimization, gradient based optimization, non-gradient based optimization.

**Materials Design and Manufacturing:** Processing, structure, mechanical properties, and performance of common engineering materials (metals, ceramics, polymers, composites), load and stress analysis, failure due to static and variable loading, imperfections and strengthening mechanisms. **Computer Aided Design:** Parametric and non-parametric curves including Hermite and Bezier curves, surface modeling, solid modeling (feature based, boundary representation, constructive solid geometry), assembly modeling, engineering drawings along with dimensioning, spatial visualization, simulation and analysis of engineering problems (e.g., description of: analysis type, material modeling, boundary conditions & loads, mesh characteristics, interpretation of results).

References:

APPENDIX I

Qualifying Examination Application
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 Graduate Program Administrator.

Name: ______________________________________ Student ID #: __________________

Select the exams you will be completing in____________________ (term & year):

☐ Concentration Area (circle one): Dynamic Systems & Controls
    Manufacturing & Design Innovation
    Mechanics & Materials
    Thermal & Fluid Sciences

☐ Mathematics Exam

Student Signature: __________________________ Date: ________________

Dissertation Advisor Signature: ______________________ Date: ________________

Educational Background:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>GPA</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Current Course Schedule:

<table>
<thead>
<tr>
<th>Course Sub. &amp; Num.</th>
<th>Course Title</th>
<th>Days &amp; Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Special Requests/Schedule Considerations:

For Mechanical Engineering Graduate Office use only

Degree Plan: ___________ Registration status: ___________ Graduate Course GPA: ______

Approved by: ______________________ Date: ____________________

Rev. 8/18
APPENDIX J

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 at least one semester before you intend to complete the exam.
  o Follow guidelines for supervising committee in the PhD Student Handbook.

— In the semester you intend to complete the Comprehensive Exam, you must register in at least 3 credit hours of coursework.

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

— Submit Request for Examination Form signed by all members of your committee to Mechanical Engineering Graduate Program Administrator at least two weeks prior to the scheduled exam date.

— Provide a copy of your written dissertation proposal to each member of your committee at least two weeks before the scheduled exam date.

— Present dissertation proposal to supervising committee and complete oral exam.

— Submit signed Comprehensive Examination Report to Mechanical Engineering Graduate Program Administrator by the last day of the semester you pass the exam.

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

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 at least two weeks before the proposed examination date. Students must be registered in at least 3 hours for the semester in which the exam is to be completed and be in good academic standing. 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

COMMITTEE MEMBER SIGNATURE DATE
APPENDIX L

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 M

Request for Final Oral Examination
REQUEST FOR FINAL ORAL EXAMINATION

This form must be submitted online to https://utd-etd.tdl.org/ and must be accompanied by a PDF of the dissertation two weeks prior to date of examination. See Submission Guide for more details.

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 UTD E-MAIL: __________________________________________________________

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 COMMITTEE WILL BE PHYSICALLY ABSENT)

Check one if applicable:

WILL ATTEND VIA SKYPE OR PHONE (Committee Member Remote form required)

WILL BE ABSENT (Committee Member Absent form required)

Last Updated: January 26, 2017
Office of Graduate Studies
Doctor of Philosophy in Mechanical Engineering

APPENDIX N

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 O

Graduation Checklist
GRADUATION CHECKLIST

Doctoral Candidates:
- Check with your program to ensure that all necessary coursework to graduate has been completed. Your status will need to be changed to “eligible to graduate” in Galaxy.

- 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).

- 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.

- Check with your program for any holds that may be on your student account.

- Fill out the Application for Graduation online through Galaxy by the deadline listed on the Academic Calendar.

- 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.

- If after you have applied, you realize you are not going to graduate, notify the graduate program administrator in your department as early as possible.

- Make sure that the UTD Records Office has your most current mailing address to ensure that your diploma is sent to the correct location.

- Refer to the Checklist for Final Submission of Doctoral Dissertation and Preparation of Dissertation and Thesis pages on The Office of Graduate Education website.