



**DEPARTMENT OF MECHANICAL ENGINEERING**

**GRADUATE ADVISING GUIDE**

**2018-2019 ACADEMIC YEAR**

**MECHANICAL ENGINEERING GRADUATE ADVISING OFFICE**

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# **SECTION I: ABOUT THE DEPARTMENT**

## **DEPARTMENT OF MECHANICAL ENGINEERING GRADUATE PROGRAMS**

### **Degrees Offered**

The Department of Mechanical Engineering at the University of Utah (abbreviated ME EN) administers graduate programs of study and grants the following graduate degrees in mechanical engineering:

- Master of Science (Thesis and Non-Thesis)
- Bachelor of Science/Master of Science (Thesis)
- Master of Science/Master of Business Administration Dual Degree (Non-Thesis)
- Master of Philosophy
- Doctor of Philosophy

### **About Our Policies**

ME EN graduate programs are operated according to the policies and procedures of the Graduate School and those found within this document. The Graduate Catalog, which documents all important policies and procedures, is accessible through the University of Utah website at <http://gradschool.utah.edu/graduate-catalog/>. The catalog is a comprehensive source of information about admission, registration, financial aid, housing, campus facilities, degree requirements and departmental degree programs.

The Department and the University seek to provide equal access to its programs, services, and activities to people with disabilities.

Any requests for exceptions to these general admission policies should be directed in writing to the ME EN Director of Graduate Studies.

## **SECTION II: DEGREE PROGRAMS OFFERED**

**Table 1: Numerical Comparison of Graduate Degree Requirements**

<b>Requirement</b>	<b>M.S. (Thesis)</b>	<b>M.S. (Non-thesis)</b>	<b>Ph.D. (post-M.S.)</b>	<b>Ph.D. (post-B.S.)</b>
<b>Program Coursework</b>				
Minimum total credit hours	30	30	32	53
Minimum regular course <sup>1</sup> credit hours	21	30	18	39
Minimum regular Mechanical Engineering course credit hours	12	15	12	24
Minimum regular Mechanical Engineering course credit hours at 7000 level	NA	NA	6	9
Maximum credit hours for ME EN 6950 Independent Study (after B.S.)	3	3	3	6
Minimum credit hours in area of specialization	NA	15	NA	NA
<b>Research</b>				
Credit hours for ME EN 6975 M.S. Thesis Research	9	NA	NA	NA
Minimum credit hours for ME EN 7970 Ph.D. Dissertation	NA	NA	14	14
<b>Administrative</b>				
Minimum credit hours at the University of Utah	24	24	26	47
Maximum transfer credit hours	6	6	6	6
Maximum non-matriculated credit hours	9	9	9	9
Maximum credit hours taken as an undergraduate applied to graduate degree (cannot also apply to B.S. degree)	6	6	0	6
Minimum credit hours for full-time status	9	9	9	9
Supervisory Committee members (majority must be regular ME EN faculty)	3	3	5	5
Time limit (years)	4	4	7	7

Notes:

1. ME EN or allied field course taken at the 6000/7000 level.
2. “Regular” ME EN courses = scheduled classroom/lab courses including 6960 and 7960.

# MASTER OF SCIENCE, THESIS

## About the Degree

The Master of Science, Thesis (MST) is a research-oriented degree. A student who intends to pursue the Ph.D. degree at a later stage is encouraged to pursue the MST rather than the Master of Science, Non-Thesis degree because of its research orientation.

## Course Requirements

- 30 Total Credit Hours
  - 21 credit hours in courses relevant to the student's academic program
    - All regular courses to be counted toward the degree must be graded B- or higher
      - 12 credit hours must be in regular ME EN courses
      - 9 credit hours of electives in Math, Science or Engineering.
  - 9 credit hours of ME EN 6975, Master's Thesis Research (graded CR/NC)
    - All additional research credit hours must be ME EN
- No more than 3 credit hours of independent study (ME EN 6950) may be used
  - Note that these credit hours do not count as "regular" ME EN courses
- No more than 9 non-matriculated credit hours
- No more than 6 transfer credits
- Only courses in engineering, mathematics, and science are acceptable
- The student must obtain an overall GPA equal to or higher than a 3.0 from all courses taken

## Supervisory Committee

The student must select a permanent supervisory committee chair by the end of the second semester in the program. Committees must meet the following requirements:

- The supervisory committee consists of three faculty members.
- The student's advisor serves as the chair of the supervisory committee and must be regular (tenure-line) faculty from the Department of Mechanical Engineering.
- At least two of the three committee members must be regular (tenure-line) faculty from the Department of Mechanical Engineering.
- Members must have a research specialty consistent with the student's specialization area.

## Program of Study

The program of study and thesis work is completed under the direction and approval of the supervisory committee. The committee chair (the student's advisor) will assist the student in planning the program of study, and should encourage breadth by selection of one or more courses outside of the Department in areas such as basic science, statistics, and mathematics. Graduate courses should be selected after consultation with the student's permanent supervisory chair, temporary advisor, or the Director of Graduate Studies. The cumulative GPA of courses listed on the program of study must be greater than or equal to a 3.0.

## *Approval process*

1. The student must obtain and fill out the *MS Thesis Program of Study* form.
2. The student must list all classes – past, present, and future – that are to count toward the MST, including research hours.
3. At least seven months prior to graduation, the student must gather original signatures from all three committee members, and then submit the form to the Graduate Advisor.

4. The Graduate Advisor will then input all the information from the paper form into the electronic records system via CIS.
5. The three committee members will approve the program of study on the form. The Director of Graduate Studies and the Graduate School will all electronically approve the program of study. Students can monitor this process by logging into CIS, locating the Graduation panel under their student information, and clicking on “Graduate Student Summary.” It is the responsibility of the student to monitor their online records and to secure the proper approvals.

### Thesis Defense

The thesis requirement reflects the research orientation of this degree. The research work associated with a Master of Science thesis should involve close collaboration with a faculty member. The thesis typically represents two years of research. Specifically, in a clearly documented manner, the thesis must:

- Reflect an understanding of the current and past state of knowledge in the chosen research area through a comprehensive literature review of the subject.
- Clearly state the goals of the research and justify the value of the research results to the engineering and/or scientific community.
- Result in a substantive contribution to the engineering and/or scientific community.

The student is required to defend the thesis and research work at a formal oral presentation that is open to the public.

### *Scheduling the defense*

1. Students must first communicate with their committee members to find a date and time for the defense. Students must schedule their defense at least two weeks in advance.
2. Students need to submit a complete and formatted copy of their thesis to each committee member at least two weeks before the scheduled defense date.
3. Once a date has been set, students can see the Graduate Advisor to schedule a conference room. If a conference room is not available, students will need to check with the other departments in the college or with the University’s Scheduling Office to schedule a room.
4. As soon as students have found a date, time, and place for the defense, they must send the Graduate Advisor the title and abstract of their thesis. The advisor will then send the student important forms and information for the day of the defense.

### *Defense paperwork*

**Table 2: Required M.S. Thesis Defense Paperwork**

FORM NAME	PURPOSE	WHO PREPARES IT
<i>Report of the Final Exam</i>	Indicates that the student has passed the defense	The student, on white paper, two copies
<i>Supervisory Committee Reading Approval*</i>	Indicates that the thesis is ready for format corrections. This form goes in the front of the finished, published thesis.	The student, on white paper, two copies
<i>Final Reading Approval*</i>	Indicates that the entire thesis is ready for publication. This form goes in the front of the finished, published thesis.	The student, on white paper, two copies

\* If the committee approves the content of the manuscript, they will sign these forms immediately following the defense. If not, the student must make whatever corrections the committee recommends, and then have them sign the forms.

*After the defense*

1. Once the committee approves of the thesis content, students must submit their manuscript - with signed thesis sheets - to the Department Chair for approval. The chair must be allotted at least one week to review and approve the manuscript.
2. After the chair approves the thesis and signs the Final Reading Approval, the student must submit their manuscript and sheets to the Thesis Editor to begin format approval. This must be done in accordance with Graduate School deadlines in order to graduate in a given semester: <http://gradschool.utah.edu/current-students/graduation-overview-for-masters-candidates/>.
3. Thesis must be approved by Thesis Editor no later than eight months from the date of the thesis defense. This eight-month deadline includes thesis corrections, final supervisory committee approval, department chair approval, and final approval by the thesis office and graduate school. If this requirement is not met, any prior approvals of the thesis will be voided, the student will have to re-register for one thesis credit, and re-submit and re-defend the thesis.
4. Once format corrections are finished, the student must then work with the Thesis Office to submit their manuscript to ProQuest (or USPACE) for online viewing.
5. After all of these steps are completed, the student will be cleared for graduation. Please note that a student is not considered “graduated” for merely passing the defense. The thesis must also successfully pass corrections and be published before a degree may be awarded.

# MASTER OF SCIENCE, NON-THESIS

## About the Degree

The Master of Science, non-thesis (MSNT) degree is designed to provide an in-depth educational experience in a specific area of emphasis and to provide more breadth at an advanced level through elective courses in complementary areas. As opposed to the MST, there is no required research component. Students desiring some research experience may construct an independent study contained within a single semester. Students desiring a rigorous research experience or who are planning to pursue the Ph.D. degree are encouraged to pursue the MST.

## Course Requirements

- 30 Total Credit Hours
  - 30 credit hours in courses relevant to the student's academic program
    - 15 credit hours must be in regular ME EN courses\*
      - These hours must be in one of the Mechanical Engineering focus areas:
        - Design, Ergonomics, Manufacturing, and Systems
        - Robotics, Controls, and Mechatronics
        - Solid Mechanics
        - Thermal-Fluids and Energy Systems
      - 9 hours of the focus courses must be graded B+ or higher
    - 15 credit hours of electives in Math, Science or Engineering.
      - Elective courses to be counted toward the degree must be graded B- or higher
- No more than 3 credit hours of Independent Study (ME EN 6950) may be used
  - Note that these credit hours do not count as “regular” ME EN courses
- No more than 9 non-matriculated credit hours
- No more than 6 transfer credits
- Only courses in engineering, mathematics, and science are acceptable.
- The student must obtain an overall GPA equal to or higher than a 3.0 from all courses taken

\* Robotics Track students have 18 hours in Required, Perception, Cognition, and Action courses as their focus.

## Supervisory Committee

The student must select a permanent supervisory committee chair no later than the end of the second semester in the program. Committees must meet the following requirements:

- The supervisory committee consists of three faculty members.
- The student's advisor serves as the chair of the supervisory committee and must be regular (tenure-line) faculty from the Department of Mechanical Engineering.
- At least two of the three committee members must be regular (tenure-line) faculty from the Department of Mechanical Engineering.
- Members must have a research specialty consistent with the student's specialization area.

## Program of Study

The program of study and thesis work is completed under the direction and approval of the supervisory committee. The committee chair (the student's advisor) will assist the student in planning the program of study, and should encourage breadth by selection of one or more courses

outside of the Department in areas such as basic science, statistics, and mathematics. Graduate courses should be selected after consultation with the student's permanent supervisory chair, temporary advisor, or the Director of Graduate Studies. The grades of all courses listed on the program of study must be greater than or equal to a 3.0 and the grades in 3 of the 5 (9 hours) focus courses must be greater than a B+.

#### *Approval process*

1. The student must obtain and fill out the *MS Non-thesis Program of Study* form.
2. The student must list all classes - past, present and future – that are to count toward the MSNT, including transfer hours.
3. At least seven months prior to graduation, the student must gather original signatures from all three committee members, and then submit the form to the Graduate Advisor.
4. The Graduate Advisor will then input all the information from the paper form into the electronic records system via CIS.
5. The three committee members will approve the program of study on the form. The Director, and the Dean of the Graduate School will all have to electronically approve the program of study. Students can monitor this process by logging into CIS, locating the Graduation panel under their student information, then clicking on “Graduate Student Summary.” It is the responsibility of the student to monitor their online records and to secure the proper approvals in a timely manner.

#### **Comprehensive Final Exam Format**

A Comprehensive Final Exam is required. The purpose of the exam is to test the student's competency in the chosen area of focus

#### *Exam format*

The exam is a written test based on the student's three selected focus courses. The exam is open-book and open-notes. The exam duration is three hours.

#### *Examiners for the MS non-thesis comprehensive exam*

The student will indicate three out of five focus courses on which he/she intends to be tested and recommend examiners for each course. The graduate committee will assign examiners for the different exam areas/courses. The examining committee does not need to follow graduate school rules on a minimum number of tenured/tenure-track faculty. The examiners for the non-thesis comprehensive exam will provide their exams to the Graduate Advisor two weeks prior to the exam date. If the student fails one or more areas of the exam, copies of the exam performance appraisal (pass/fail with comments) and the actual exam will be disseminated to the student's supervisory committee. The supervisory committee has the option to review the exam results and vote by majority to either approve or override any failing results. The committee will then sign final paperwork related to the exam.

#### *When to take the exam*

Students typically take the comprehensive exam during their last semester of their graduate studies. A student may opt to take the exam earlier in their program of study. The student must be enrolled during this semester in which they are appearing for the comprehensive exam. Comprehensive exams are not administered during Summer.

#### *Retakes*

Students will have one chance to retake the exam the next semester. Students must register for at least one course and retake the exam in the next semester. If a student does not pass the exam at the second attempt, then that student will be dismissed from the Department of Mechanical Engineering's master's program.

*Prior to the Exam: Detailed Procedures*

- By the first week of the semester, the student will be required to submit a Notification of Intent to take the Comprehensive Exam.
- The exam will typically take place during the 13<sup>th</sup> week of the semester (Fall or Spring only). The exact date, time and location will be announced during the third week of the semester.

*During the Written Exam: General Rules and Procedures*

- The written exam will take 3 hours to complete with each subject area being allotted 1 hour.
- It is expected that the exam will test the comprehensive as well as integrative knowledge of the student.
- The exam is open book and open notes. Laptops are only permitted during the exam with subject examiner permission for access to electronic textbooks, electronic notes, and Canvas course websites.

*After the Exam: Scoring*

- Each subject area of the exam will be graded on a 100-point scale.
- A score of 75 or higher in each subject area indicates a passing grade in the exam.
- Students will have to pass all three subject area portions to pass the comprehensive exam. If the student does not pass a subject area, the student's supervisory committee will vote to determine if the student will be deemed a partial pass and will retake any failed subject areas during their one retake opportunity.
- The examining or supervisory committee may require a follow-up oral exam (the following week) in case they need additional clarification on the performance in the written exam.
- Due to graduation deadline requirements, examiners are requested to grade and score the exam within 5 days from the exam date.
- Scores and committee pass/fail recommendations will be certified by the Department faculty.
- Scores will be made available by the end of Week 15.

**Research and/or Project Requirements**

There are no research and/or project requirements for the degree. In the event that a student desires to conduct a research project, such as the case where the research could be applied to a subsequent Ph.D. dissertation topic, the project should be conducted as an ME EN 6950 – Independent Study course. Should a project be undertaken, a formal presentation or defense of the research project is not required. Under no circumstance may a project defense be substituted for the Comprehensive Final Exam requirement.

# BACHELOR OF SCIENCE/MASTER OF SCIENCE PROGRAM

## About the Program

For undergraduate students interested in vigorous pursuit of research, the Department offers a combined degree program intended to foster undergraduate research and to accelerate progress toward the M.S. degree. The program allows advanced students to complete both their B.S. and M.S. degrees in five years, one year earlier than if the degrees were done separately. This gives students an advantage in the job market by providing them with more training, an advanced degree, more research experience and increased earning potential.

Students are accepted into the BS/MS program in the spring of their junior year. During the senior year, 2 of the 4 undergraduate technical electives (6 hours) are taken at the graduate level and are counted toward the M.S. degree. This means the B.S. degree is shortened by 6 credit hours. The students also use their senior year to get started on their thesis research. Then, during the final year (the 5th year of the combined degree), students finish their graduate coursework, conduct research, and defend their thesis. At the end of the 5-year program, students graduate with their B.S. and M.S. simultaneously.

This program is designed for Domestic students only. International students interested in this combined program must meet with the Graduate Advisor prior to being screened for the program by the Department.

## Course Requirements

- 30 Total Credit Hours
  - 21 credit hours in courses relevant to the student's academic program
    - All regular courses to be counted toward the degree must be graded B- or higher
      - 12 credit hours must be in regular ME EN courses
      - 9 credit hours of electives in Math, Science or Engineering.
    - 9 credit hours of ME EN 6975, Master's Thesis Research (graded CR/NC)
      - All additional research credit hours must be ME EN
  - No more than 3 credit hours of Independent Study (ME EN 6950) may be used
    - Note that these credit hours do not count as "regular" ME EN courses
  - No more than 9 non-matriculated credit hours
  - No more than 6 transfer credits
  - Only courses in engineering, mathematics, and science are acceptable
  - The student must obtain an overall GPA equal to or higher than a 3.0 from all courses taken

## Financial Aid Opportunities

Students in the BS/MS Program may receive financial support in the form of an hourly position during the fourth year. After students are admitted to the Graduate School and classified as an M.S. student, they may receive funding as a research or teaching assistant and are eligible for the University of Utah Tuition Benefit Program.

## Program Requirements

To be accepted into the BS/MS Program, students must meet the following requirements:

- Mechanical Engineering major at the University of Utah
- Junior status in the major recommended

- 3.5 GPA
- Taken the GRE (a quantitative score about the 80<sup>th</sup> percentile is required)
- A faculty advisor/research sponsor

### **Application Procedures**

- Take the GRE at least 2 months prior to screening for the program to allow the scores enough time to be processed and received by the Department.
- To be accepted into the program, students must submit a BS/MS program screening package to the Graduate Advisor for review (preferably during their junior year). Students must submit the following materials:
  - Program Screening Form (<https://mech.utah.edu/academics/undergraduate/current-students/combined-bsms-degree-requirements/bs-ms-application/>)
  - Statement of Purpose
  - Current Resume
  - GRE scores
  - Letter of recommendation from the faculty advisor/research sponsor

### **Program Procedures**

Once students are accepted into the BS/MS program, they have several checkpoints they must pass in order to graduate by their fifth year with two degrees. These checkpoints are designed to keep students on track:

#### *Between Junior and Senior Years:*

- Students are encouraged to begin their research for the M.S. degree.
- Students should clear with Undergraduate Advisor that they have taken two 5000-level technical electives and should confirm what B.S. degree requirements remain.

#### *Senior Year:*

- Enroll for a minimum of two (6 hours) and a maximum of four (12 hours) 6000-level technical electives
- If the GRE quantitative score is less than the 80<sup>th</sup> percentile, the student will need to retake the GRE and achieve that score
- Apply for graduate status by the posted deadlines found here: <https://mech.utah.edu/academics/grads/future-students/>. This must be done in accordance to the application procedures for all ME EN graduate students, with the following rules:
  - The statement of purpose used for the application to the BS/MS program may be reused.
  - Three letters of recommendation are required. One letter must come from the student's research advisor. If the research advisor also wrote the letter of recommendation for the BS/MS application, that letter may be reused.
  - If the GRE quantitative score from the junior year is above the 80<sup>th</sup> percentile, the junior-year scores may be reused. If not, the GRE must be retaken and a score higher than the 80<sup>th</sup> percentile must be achieved.
- Review draft *MS Thesis Program of Study* with research advisor.

#### *M.S. Last Semester:*

- Defend thesis. The student is encouraged to meet with his/her faculty advisor to ensure that thesis milestones are met in a timely manner.

- Once the committee approves of the thesis content, students must submit their manuscript - with signed thesis sheets - to the Department Chair for approval. The chair must be allotted at least one week to review and approve the manuscript.
- After the chair approves the thesis and signs the Final Reading Approval, the student must submit their manuscript and sheets to the Thesis Editor to begin format approval. This must be done in accordance with Graduate School deadlines in order to graduate in a given semester: <http://gradschool.utah.edu/current-students/graduation-overview-for-masters-candidates/>.
- Thesis must be approved by Thesis Editor no later than eight months from the date of the thesis defense. This eight-month deadline includes thesis corrections, final supervisory committee approval, department chair approval, and final approval by the thesis office and graduate school. If this requirement is not met, any prior approvals of the thesis will be voided, the student will have to re-register for one thesis credit, and re-submit and re-defend the thesis.
- Once format corrections are finished, the student must then work with the Thesis Office to submit their manuscript to ProQuest (or USPACE) for online viewing.
- After all of these steps are completed, the student will be cleared for graduation. Please note that a student is not considered “graduated” for merely passing the defense. The thesis must also successfully pass corrections and be published before a degree may be awarded.

## **Research**

Students are encouraged to begin their research work for the M.S. degree as soon as possible during their undergraduate program. Work independently with the faculty advisor on thesis research. Students are also encouraged to participate in UROP opportunities during their undergraduate program.

## **Other BS/MS Program Policies**

All policies and procedures for the MST degree also apply to BS/MS students. Please see that section for further details.

Students complete all semester credit hours of qualified study for both degrees:

- A minimum of 30 semester credit hours must satisfy the Department’s requirements for the M.S. (thesis option) degree.
- The minimum semester credit hours to meet the B.S. degree requirements of the University of Utah, the College of Engineering, and the Department. The minimum number of credit hours for the combined programs is 6 less than that required for the traditional B.S. and M.S. degrees obtained separately.

The only graduate degree that students may pursue in the combined program is the Masters of Science (thesis option). Students may not be awarded a graduate degree of Master of Science (non-thesis option) in the combined BS/MS program.

Courses listed at both the 5000 and 6000 level must be taken at the 6000 level if they are to be applied to the M.S. degree.

Students must take a minimum of 6 credit hours of graduate credit the senior year. Domestic students may take up to a maximum of 12 credit hours of graduate credit. International students may only take a maximum of 6 credit hours of graduate credit.

Transfer from undergraduate to graduate status occurs after completion of the B.S. degree requirements. A student is eligible for the Tuition Benefit Program administered by the Graduate School *after* graduate status is conferred.

The supervisory committee should conduct a mid-program review after 2 semesters in the BS/MS Program.

Both the B.S. and M.S. degrees are conferred simultaneously following completion of the program.

No student will be awarded a separate M.S. degree without satisfying all requirements for the B.S. degree.

Students wishing to exit the combined program can apply qualified coursework toward the traditional B.S. and M.S. degree requirements without penalty.

# MASTER OF SCIENCE/MASTER OF BUSINESS ADMINISTRATION DUAL DEGREE PROGRAM

## About the Program

The MS/MBA program combines students' applied interests and training in Engineering with the comprehensive business sense developed in a full-time MBA program. The result is a professional comfortable moving between technical and commercial issues. MS/MBA graduates will be, with appropriate experience, qualified to direct or manage the transition of new products, processes and systems from the laboratory to the board room.

Graduates of the MS/MBA program earn two distinct degrees in one integrated educational experience. In general, students take 21 credit hours in the College of Engineering, 45 hours in the College of Business including a 6-hour capstone project. Up to 9 credit hours appear on the program of study for both degrees reducing the hours that would be required to complete the two programs separately. The net is a two year MBA and a two year M.S. completed in 2.5 years - a considerable time and cost advantage.

## Financial Aid Opportunities

Students in the MS/MBA Program typically find funding sources outside the Department.

## Program Administration

The dual degree is jointly administered by the Department of Mechanical Engineering and the David Eccles School of Business (DESB). The engineering portion of the degree is a Master of Science, non-thesis degree. All MSNT policies and procedures apply to MS/MBA students. Students should also acquire program information from the DESB regarding the MBA portion of the degree.

## Application Procedures

Students should apply to both the DESB and to the MSNT simultaneously and separately. Students will have to fill out the University general application twice, in addition to completing both degrees' departmental application procedures. Application procedures for the MSNT are available at the beginning of this handbook. Application procedures for the MBA are available through the DESB.

## Coursework

- 30 Total Credit Hours
  - 21 credit hours in courses relevant to the student's academic program
    - 15 credit hours must be in regular ME EN courses
      - These hours must be in one of the Mechanical Engineering focus areas:
        - Design, Ergonomics, Manufacturing, and Systems
        - Robotics, Controls, and Mechatronics
        - Solid Mechanics
        - Thermal-Fluids and Energy Systems
      - Focus courses to be counted toward the degree must be graded B+ or higher
    - 6 credit hours of electives in Math, Science or Engineering.

- Elective courses to be counted toward the degree must be graded B- or higher
- 9 credit hours in courses that are dual-counted
  - 3 MBA Capstone credit hours
  - 3 credit hours from this list: Finance 6380, Finance 6390, Finance 6400, IS 6420, IS 6482, IS 6483, OIS 6425, or OIS 6610
  - 3 credit hours of Mechanical Engineering courses that the MBA program is willing to accept for credit
- No more than 3 credit hours of Independent Study (ME EN 6950) may be used
  - Note that these credit hours do not count as “regular” ME EN courses
- No more than 9 non-matriculated credit hours
- No more than 6 transfer credits
- The student must obtain an overall GPA equal to or higher than a 3.0 from all courses

Table 3 shows the typical course schedule of a dual-degree student. Please note: a week-long orientation and teams course precedes the first fall semester.

**Table 3: MS/MBA Example Course Schedule**

Fall– 17.5 Credits	Spring – up to 17.5 Credits
<b>Intensive Week</b> <b>MGT 6050</b> (1.5) Laying the Foundations of Teamwork	<b>ACCTG 6001</b> (3.0) Managerial Accounting I
<b>ACCTG 6000</b> (3.0) Financial Accounting	<b>FINAN 6020</b> (3.0) Financial Management
<b>FINAN 6025</b> (3.0) Managerial Economics	<b>IS 6010</b> (1.5) Information Technology for Organizational Competitiveness
<b>OIS 6040</b> (1.5) Data Analysis & Decision Making I	<b>OIS 6061</b> (1.5) Operations Management II
<b>OIS 6060</b> (1.5) Operations Management I	<b>MGT 6052</b> (2.0) Management Communication
<b>MKTG 6090</b> (3.0) Marketing Management	<b>MBA 6001</b> (1.0) Career Perspectives
<b>MBA 6000</b> (1.0) Career Strategies	<b>ME EN (3.0) Core/Required Course</b>
<b>ME EN (3.0) Core/Required Course</b>	<b>ME EN (3.0) Core/Required Course</b>
<b>Summer Internship</b>	
Fall – up to 17.5 credits	Spring – 16.5 Credits
<b>STRAT 6071</b> (3.0) Competitive Strategy	<b>MBA 6800</b> (3.0) Integrative Exp (Capstone)
<b>MBA 6002</b> (1.0) Market Readiness	<b>MBA 6003</b> (0.5) TBD
<b>MGT 6051</b> (3.0) Managing and Leading in Organizations	<b>ME EN (3.0) Core/Required Course</b>
<b>ME EN (3.0) Core/Required Course</b>	MBA Elective
<b>ME EN (3.0) Core/Required Course</b>	MBA Elective
MBA Elective	MBA Elective

2 <sup>nd</sup> Summer Internship	
Fall – up to 17.5 credits	Graduation
ME EN Capstone Portion	72.0 Total Hours
<b>ME EN (3.0) Core/Required Course</b>	
MBA Elective	
MBA Elective	

### Program Procedures

Once students are accepted into the MS/MBA program, they proceed through each degree according to the coursework matrix above. The engineering courses should be chosen by the student in conjunction with his/her ME EN faculty advisor.

*By the end of the first year:*

- Students should have a permanent ME EN faculty advisor and a DESB mentor to monitor the capstone work
- Students should form a 3-person committee with their ME EN advisor as the chair

*During Fall Semester of the second year:*

- Submit Capstone proposal to the DESB
- Submit *MS Non-thesis Program of Study* form to ME EN Advising Office
- Apply for graduation

*During Spring Semester of the second year:*

- Complete Capstone project
- Obtain sign-off on capstone by their DESB Dual Degree Director
- Schedule, take and pass MSNT final comprehensive exam

## **MASTER OF PHILOSOPHY**

### **About the Degree**

The Master of Philosophy (M.Phil.) degree requires the same qualifications for admission and scholarly achievement as the Ph.D. degree but does not require a doctoral dissertation or defense. There is no separate program for this degree. All regulations covering the Ph.D. degree with respect to supervisory committees, course credit hour requirements, and qualifying examinations also apply to the M.Phil. degree. Like the Ph.D., the M.Phil. is a terminal degree. A student is not considered a candidate for both degrees in the Department.

### **Pursuing a Ph.D. after the M.Phil.**

Students awarded the M.Phil. degree in Mechanical Engineering and who wish to pursue a doctorate in Mechanical Engineering must have their M.Phil. rescinded by formal action of the Graduate Council. This action must be initiated by a written recommendation from the Graduate Committee and a written request from the student.

### **Exceptions**

Individual student exceptions to the general requirements for the master's degree stated above must be approved by the Dean of the Graduate School upon recommendation of the student's supervisory committee and the Director of Graduate Studies or Department Chair.

## **DOCTOR OF PHILOSOPHY, POST-M.S.**

The Doctor of Philosophy degree is designed to give students in-depth study in a particular research emphasis. Compared to our master's students, a larger percentage of doctorate students receive funding. In the workforce, doctorate graduates generally earn more than graduates with only a Masters degree. They have the flexibility to choose a career in industry, research, or education.

A student may apply for the Ph.D. post-M.S. program after completing a Master of Science (thesis or non-thesis) degree from an accredited institution.

### **Course Requirements (post M.S. degree)**

- A Minimum of 32 Total Credit Hours
  - A minimum of 18 credit hours in courses relevant to the student's academic program
    - All regular courses to be counted toward the degree must be graded B- or higher
      - 12 credit hours must be in regular ME EN courses
        - A minimum of 6 credit hours in regular Mechanical Engineering classes must be at the 7000 level
        - 6 credit hours of electives in Math, Science or Engineering.
    - A minimum of 14 credit hours of ME EN 7970, PhD Dissertation Research (graded CR/NC)
      - All additional research credit hours must be ME EN
- Upper division course work in allied fields is allowed
- No more than 3 credit hours of independent study (ME EN 6950) may be taken after the completion of the Master of Science degree may be applied to the Ph.D. degree
  - Note that these credit hours do not count as “regular” ME EN courses
- No more than 9 non-matriculated credit hours
- No more than 6 transfer credits
- Only courses in engineering, mathematics, and science are acceptable
- The student must obtain an overall GPA equal to or higher than a 3.0 from all courses taken

### **Additional Requirements**

- Successful completion of the Ph.D. Qualifying Examination.
- Successful completion of the Research Comprehensive Examination (Ph.D. Proposal Defense).
- Successful completion of an approved research program representing at least 14 credit hours of ME EN 7970.
- Successful oral defense of the Doctoral dissertation and successful approval of a written dissertation before the supervisory committee.

### **Faculty Advisor**

Each student should have a permanent faculty advisor at the time of admissions. If not, the student must select a permanent advisor by the end of the first semester of Ph.D. degree work. The advisor oversees the Ph.D. student's program, gives recommendations for selecting courses and supervises the dissertation research. It is recommended that the advisor be a tenured/tenure-track faculty member of the Department.

### **Ph.D. Qualifying Examination**

The first checkpoint in a doctorate student's career is the Qualifying Exam. Students must pass this exam in order to be officially admitted to candidacy in the Ph.D. program. The exam is directed at testing students' understanding and application of basic concepts and mastery of technical knowledge in different areas. The exam is administered near the end of the Fall and Spring semesters, and should be taken early in the student's Ph.D. program. Please see the chapter, "Ph.D. Qualifying Exam Student Instructions" for full exam procedures.

### **Supervisory Committee**

Within one semester of successful passage of the qualifying exam, a five-faculty-member supervisory committee is selected (Summer does not count as a semester). The chair of this committee is the student's permanent advisor. The other members of the committee are selected by the committee chair in consultation with the student. The Graduate Committee may make recommendations regarding committee membership. A majority of the supervisory committee members must be faculty members from the Department. At least one member must be from outside the Department. Failure to form a supervisory committee within one semester of passing the qualifying exam, will result in the student being placed on probation for failure to make due progress.

### **Research Proposal**

The second checkpoint is a dissertation research proposal defense, which must be conducted within two semesters of passing the written component of the qualifying examination and at least 8 months prior to the dissertation defense (Summer does not count as a semester). The proposal defense assesses the student's research abilities and is administered and scored by the student's supervisory committee. Passing the proposal defense indicates that the student's proposed dissertation research is approved by the committee and can commence. Failure to propose within two semesters of passing the qualifying exam, will result in the student being placed on probation for failure to make due progress.

Students are required to submit a written research proposal and a proposal defense summary to their supervisory committee, 2 weeks prior to the oral defense. The written research proposal must follow a standard format such as those suggested by NSF, DOE, NIH, or other funding agencies as appropriate, and thus must include a one-page project summary (that can be similar to the defense summary – see below), research/project description, and associated bibliography. The student may provide a short bio-sketch and a budget, if relevant. The research/project description must be 15 pages or less and include a time table. The proposal defense summary is a succinct, one-page description of what your PhD research will accomplish. The Proposal Defense Summary requirements are outlined in Section IV.

### **Program of Study**

The program of study and thesis work is completed under the direction and approval of the supervisory committee. The committee chair (the student's advisor) will assist the student in planning the program of study, and should encourage breadth by selection of one or more courses outside of the Department in areas such as basic science, statistics, and mathematics. Graduate courses should be selected after consultation with the student's permanent supervisory chair, temporary advisor, or the Director of Graduate Studies. The grades of courses listed on the program of study must be greater than or equal to a 3.0.

### *Approval process*

1. The student must obtain and fill out the *PhD Post-MS Program of Study* form.
2. The student must list all classes - past, present and future – that are to count toward the PhD, including transfer hours.
3. Seven months prior to graduation, the student must gather original signatures from all five committee members, and then submit the form to the Graduate Advisor.
4. The Graduate Advisor will then input all the information from the paper form into the electronic records system via CIS.
5. The five committee members will approve the program of study on the form. The Director of Graduate Studies and the Graduate School will all electronically approve the program of study. Students can monitor this process by logging into CIS, locating the Graduation panel under their student information, then clicking on “Graduate Student Summary.” It is the responsibility of the student to monitor their online records and to secure the proper approvals in a timely manner.

### **Dissertation Defense and Final Oral Examination**

The final checkpoint in the Ph.D. program is the dissertation defense, which is given at least 8 months after the research proposal and in the student’s last semester. This defense is open to the public and is an in-depth explanation of the student’s doctoral research. The defense is the final examination in the doctoral program. It can be broken down into three parts: a written exam (typically the submitted dissertation serves as the written component of the exam), a public oral exam, and a closed oral exam.

The dissertation manuscript serves as the written portion of the exam. The dissertation must:

- reflect an understanding of the current and past state of knowledge in the chosen research area through a literature review of the subject.
- clearly state the goals of the research and justify its value to the engineering and scientific community.
- demonstrate a fundamental and original contribution, which significantly advances engineering science in the chosen area of research.

A dissertation defense summary is required and must be submitted the committee 2 weeks prior to the oral defense (along with the complete dissertation manuscript). The dissertation defense summary is a succinct, one-page description of a student’s accomplishments and is accompanied by a second page that outlines deliverables achieved. The Dissertation Defense Summary requirements are outlined in Section IV.

### *Publication Requirement*

Because the department values timely dissemination of results, some portion of the dissertation must have been submitted for publication in a committee approved, peer-reviewed journal at the time of the defense. Yet, faculty members may have differing publication requirements for their students. Therefore, in some cases, students may not qualify to defend until they have met these publication requirements.

### *Written Dissertation*

Contents, results, and conclusions associated with the student's doctoral research and written dissertation are presented by the student to the supervisory committee for examination and evaluation. The complete and formatted dissertation manuscript should be given to the

committee at least two weeks prior to the defense. Please follow the dissertation guidelines outlined by the Graduate School.

### *Defense Format*

The defense begins with the student's presentation of the doctoral research. The student will be evaluated on presentation skills as well as content. Members of the audience may ask the student relevant questions. After the public question-and-answer session, the audience will be excused.

After the open portion of the exam, the closed oral exam begins. The committee may pursue additional discussion and questions with the student. The acceptability of the research effort, the content and conclusions of the dissertation, and the student's oral defense are considered along with other factors, as appropriate. The committee then dismisses the student and votes to determine whether the student (a) passes the exam, (b) passes the exam with modifications to the dissertation, or (c) fails the exam with or without an opportunity to repeat the examination. The chair then meets with the student to inform him/her of the committee's decision, and the reasons for that decision.

### **Manuscript Corrections**

The finish line for the Ph.D. degree is completing manuscript corrections. After successful completion of the dissertation defense, the student must complete any content corrections recommended by the supervisory committee.

1. Once the committee approves of the dissertation content, students must submit their manuscript - with signed dissertation sheets - to the Department Chair for approval.
2. After the chair approves the dissertation and signs the sheets, students must submit their manuscript and sheets to the Thesis Editor to begin format approval. This must be done in accordance with Graduate School deadlines in order to graduate in a given semester: <http://gradschool.utah.edu/current-students/graduation-overview-for-doctoral-candidates/>
3. Dissertation must be approved by Thesis Editor no later than eight months from the date of the dissertation defense. This eight-month deadline includes dissertation corrections, final supervisory committee approval, department chair approval, and final approval by the Thesis Office and graduate school. If this requirement is not met, any prior approvals of the dissertation will be voided, the student will have to re-register for one dissertation credit, and re-submit and re-defend the dissertation.
4. Once format corrections are finished, the student must then work with the Thesis Office to submit their manuscript to ProQuest (or USPACE) for online viewing.
5. After each of these steps is completed, the student will be cleared for graduation. Please note that a student is not considered "graduated" for merely passing the defense. The dissertation must also successfully pass corrections and be published before a degree may be awarded.

### **Residency Requirement**

At least one year of the doctoral program must be spent in full-time academic work at the University of Utah. This means that for two consecutive semesters, the student must be registered for 9 or more credit hours.

### **Time Limits**

At the minimum, students must complete no fewer than three full years (six semesters) of approved graduate work, inclusive of work for the master's degree. More time may be required.

In truly exceptional cases, a shorter period of time in graduate work may be approved by the Dean of the Graduate School.

A maximum time of seven years is allowed for completion of the Ph.D. degree for students who started the Ph.D. program following a master's degree. If the student requires additional time, the student's advisor must submit a letter to the Director of Graduate Studies and the Dean of the Graduate School requesting an extension with a plan for completing the program.

## **DOCTOR OF PHILOSOPHY, POST-B.S.**

The Doctor of Philosophy degree is designed to give students in-depth study in a particular research emphasis. Compared to our master's students, a larger percentage of doctorate students receive funding. In the workforce, doctorate graduates generally earn more than graduates with only a Masters degree. They have the flexibility to choose a career in industry, research, or education.

Applicants for the Ph.D. program with a Bachelor of Science degree may be accepted directly into the Doctoral program without completion of a Master of Science degree. These students are encouraged to pursue the milestone Master of Science (non-thesis) degree as part of their Ph.D. program.

### **Course Requirements (post B.S. degree)**

- A Minimum of 53 Total Credit Hours
  - A minimum of 39 credit hours in courses relevant to the student's academic program
    - All regular courses to be counted toward the degree must be graded B- or higher
      - 24 credit hours must be in regular ME EN courses
        - A minimum of 9 credit hours in regular Mechanical Engineering classes must be at the 7000 level
      - 15 credit hours of electives in Math, Science or Engineering.
    - A minimum of 14 credit hours of ME EN 7970, PhD Dissertation Research (graded CR/NC)
      - All additional research credit hours must be ME EN
- Upper division course work in allied fields is allowed
- No more than 6 credit hours of independent study (ME EN 6950) may be taken after the completion may be applied to the Ph.D. degree
  - Note that these credit hours do not count as “regular” ME EN courses
- No more than 9 non-matriculated credit hours
- No more than 6 transfer credits
- Only courses in engineering, mathematics, and science are acceptable
- The student must obtain an overall GPA equal to or higher than a 3.0 from all courses taken

### **Additional Requirements**

- Successful completion of the Ph.D. Qualifying Examination.
- Successful completion of the Research Comprehensive Examination (Ph.D. Proposal Defense).
- Successful completion of an approved research program representing at least 14 credit hours of ME EN 7970.
- Successful oral defense of the Doctoral dissertation and successful approval of a written dissertation before the supervisory committee.

### **Faculty Advisor**

Each student should have a permanent faculty advisor at the time of admissions. If not, the student must select a permanent advisor by the end of the first semester of Ph.D. degree work. The advisor oversees the Ph.D. student's program, gives recommendations for selecting courses

and supervises the dissertation research. It is recommended that the advisor be a tenured/tenure-track faculty member of the Department.

### **Ph.D. Qualifying Examination**

The first checkpoint in a doctorate student's career is the Qualifying Exam. Students must pass this exam in order to be officially admitted to candidacy in the Ph.D. program. The exam is directed at testing students' understanding and application of basic concepts and mastery of technical knowledge in different areas. The exam is administered near the end of the Fall and Spring semesters, and should be taken early in the student's Ph.D. program. Please see the chapter, "Ph.D. Qualifying Exam Student Instructions" for full exam procedures.

### **Supervisory Committee**

Within one semester of successful passage of the qualifying exam, a five-faculty-member supervisory committee is selected (Summer does not count as a semester). The chair of this committee is the student's permanent advisor. The other members of the committee are selected by the committee chair in consultation with the student. The Graduate Committee may make recommendations regarding committee membership. A majority of the supervisory committee members must be faculty members from the Department. At least one member must be from outside the Department. Failure to form a supervisory committee within one semester of passing the qualifying exam, will result in the student being placed on probation for failure to make due progress.

### **Research Proposal**

The second checkpoint is a dissertation research proposal defense, which must be conducted within two semesters of passing the written component of the qualifying examination and at least 8 months prior to the dissertation defense (Summer does not count as a semester). The proposal defense assesses the student's research abilities and is administered and scored by the student's supervisory committee. Passing the proposal defense indicates that the student's proposed dissertation research is approved by the committee and can commence. Failure to propose within two semesters of passing the qualifying exam, will result in the student being placed on probation for failure to make due progress.

Students are required to submit a written research proposal and a proposal defense summary to their supervisory committee, 2 weeks prior to the oral defense. The written research proposal must follow a standard format such as those suggested by NSF, DOE, NIH, or other funding agencies as appropriate, and thus must include a one-page project summary (that can be similar to the defense summary – see below), research/project description, and associated bibliography. The student may provide a short bio-sketch and a budget, if relevant. The research/project description must be 15 pages or less and include a time table. The proposal defense summary is a succinct, one-page description of what your PhD research will accomplish. The Proposal Defense Summary requirements are outlined in Section IV.

### **Program of Study**

The program of study and thesis work is completed under the direction and approval of the supervisory committee. The committee chair (the student's advisor) will assist the student in planning the program of study, and should encourage breadth by selection of one or more courses outside of the Department in areas such as basic science, statistics, and mathematics. Graduate courses should be selected after consultation with the student's permanent supervisory chair,

temporary advisor, or the Director of Graduate Studies. The grades of courses listed on the program of study must be greater than or equal to a 3.0.

#### *Approval process*

1. The student must obtain and fill out the *PhD Post-BS Program of Study* form.
2. The student must list all classes - past, present and future – that are to count toward the PhD, including transfer hours.
3. Seven months prior to graduation, the student must gather original signatures from all three committee members, and then submit the form to the Graduate Advisor.
4. The Graduate Advisor will then input all the information from the paper form into the electronic records system via CIS.
5. The five committee members will approve the program of study on the form. The Director of Graduate Studies and the Graduate School will all electronically approve the program of study. Students can monitor this process by logging into CIS, locating the Graduation panel under their student information, then clicking on “Graduate Student Summary.” It is the responsibility of the student to monitor their online records and to secure the proper approvals in a timely manner.

#### **Milestone Master’s**

Once the student has passed the Qualifying Exam, the student can also fill out paperwork to receive a Master of Science, non-thesis degree. The student forms a 3-member committee for the MSNT, and forms a program of study totaling 30 credit hours of coursework according to the MSNT requirements. The student then fills out and submits the following paperwork to the Graduate Advisor:

- *Request for Supervisory Committee*
- *Program of Study form*

The qualifying exam is counted in place of the MSNT final exam. Once this paperwork has been submitted, the M.S. degree will be awarded the following semester.

#### **Dissertation Defense and Final Oral Examination**

The final checkpoint in the Ph.D. program is the dissertation defense, which is given at least 8 months after the research proposal and in the student’s last semester. This defense is open to the public and is an in-depth explanation of the student’s doctoral research. The defense is the final examination in the doctoral program. It can be broken down into three parts: a written exam (typically the submitted dissertation serves as the written component of the exam), a public oral exam, and a closed oral exam.

The dissertation manuscript serves as the written portion of the exam. The dissertation must:

- reflect an understanding of the current and past state of knowledge in the chosen research area through a literature review of the subject.
- clearly state the goals of the research and justify its value to the engineering and scientific community.
- demonstrate a fundamental and original contribution, which significantly advances engineering science in the chosen area of research.

A dissertation defense summary is required and must be submitted the committee 2 weeks prior to the oral defense (along with the complete dissertation manuscript). The dissertation defense

summary is a succinct, one-page description of a student's accomplishments and is accompanied by a second page that outlines deliverables achieved. The Dissertation Defense Summary requirements are outlined in Section IV.

### *Publication Requirement*

Because the department values timely dissemination of results, some portion of the dissertation must have been submitted for publication in a committee approved, peer-reviewed journal at the time of the defense. Yet, faculty members may have differing publication requirements for their students. Therefore, in some cases, students may not qualify to defend until they have met these publication requirements.

### *Written Dissertation*

Contents, results, and conclusions associated with the student's doctoral research and written dissertation are presented by the student to the supervisory committee for examination and evaluation. The complete and formatted dissertation manuscript should be given to the committee at least two weeks prior to the defense. Please follow the dissertation guidelines outlined by the Graduate School.

### *Defense Format*

The defense begins with the student's presentation of the doctoral research. The student will be evaluated on presentation skills as well as content. Members of the audience may ask the student relevant questions. After the public question-and-answer session, the audience will be excused.

After the open portion of the exam, the closed oral exam begins. The committee may pursue additional discussion and questions with the student. The acceptability of the research effort, the content and conclusions of the dissertation, and the student's oral defense are considered along with other factors, as appropriate. The committee then dismisses the student and votes to determine whether the student (a) passes the exam, (b) passes the exam with modifications to the dissertation, or (c) fails the exam with or without an opportunity to repeat the examination. The chair then meets with the student to inform him/her of the committee's decision, and the reasons for that decision.

### **Manuscript Corrections**

The finish line for the Ph.D. degree is completing manuscript corrections. After successful completion of the dissertation defense, the student must complete any content corrections recommended by the supervisory committee.

1. Once the committee approves of the dissertation content, students must submit their manuscript - with signed dissertation sheets - to the Department Chair for approval.
2. After the chair approves the dissertation and signs the sheets, students must submit their manuscript and sheets to the Thesis Editor to begin format approval. This must be done in accordance with Graduate School deadlines in order to graduate in a given semester: <http://gradschool.utah.edu/current-students/graduation-overview-for-doctoral-candidates/>
3. Dissertation must be approved by Thesis Editor no later than eight months from the date of the dissertation defense. This eight-month deadline includes dissertation corrections, final supervisory committee approval, department chair approval, and final approval by the Thesis Office and graduate school. If this requirement is not met, any prior approvals of the dissertation will be voided, the student will have to re-register for one dissertation credit, and re-submit and re-defend the dissertation.

4. Once format corrections are finished, the student must then work with the Thesis Office to submit their manuscript to ProQuest (or USPACE) for online viewing.
5. After each of these steps is completed, the student will be cleared for graduation. Please note that a student is not considered “graduated” for merely passing the defense. The dissertation must also successfully pass corrections and be published before a degree may be awarded.

### **Residency Requirement**

At least one year of the doctoral program must be spent in full-time academic work at the University of Utah. This means that for two consecutive semesters, the student must be registered for 9 or more credit hours.

### **Time Limits**

At the minimum, students must complete no fewer than three full years (six semesters) of approved graduate work, inclusive of work for the master’s degree. More time may be required. In truly exceptional cases, a shorter period of time in graduate work may be approved by the Dean of the Graduate School.

A maximum time of seven years is allowed for completion of the Ph.D. degree for students who started the Ph.D. program following a master’s degree. If the student requires additional time, the student’s advisor must submit a letter to the Director of Graduate Studies and the Dean of the Graduate School requesting an extension with a plan for completing the program.

## **SECTION III: ABOUT THE PH.D. QUALIFYING EXAM**

## EXAM INSTRUCTIONS

### Purpose of the Qualifying Exam

To be officially considered as admitted to candidacy in the Ph.D. program, applicants must pass a qualifying exam. The exam is designed to:

- Evaluate the student's fundamental knowledge in selected core areas of mechanical engineering
- Evaluate the student's capacity to perform outstanding research
- Evaluate the student's communication skills and ability to maneuver through complex engineering problems
- Identify areas that need strengthening as the student works towards his Ph.D.

### Format Overview

The Ph.D. Qualifying Exam consists of two components, a written examination and an oral examination. Both components must be passed in order for a student to be admitted to candidacy in the Ph.D. program.

### *Written Examination*

1. Content: Students will select two subject areas (from Table 4) which support their Ph.D. research. The topics will cover fundamental material with the expectation of a graduate-level understanding of the subjects. The exam is closed book format. The time limit to complete each written exam is 2 hours. Students may obtain a corresponding syllabus for each subject area in order to prepare for the written exam. A student can pick topics within a single group or across groups.
2. Committee: Each subject area will have two predetermined, proficient exam writers and evaluators. These examiners will be selected by the respective Groups administering these subject areas.
3. When to take the written exam: Students will take the written exam no later than the third semester in the Ph.D. Program. Summer does not count as a semester. During the first week of the semester students will submit a Notification of Intent to Take the Written Component of the Qualifying Exam. Written exams will be administered during the 12<sup>th</sup> week of the Fall and Spring semesters and will be scheduled on a specific date and time. No exceptions to the time and location of the exam can be made.
4. Extensions: Students may petition the Graduate Committee for an extension prior to taking the exam, if extenuating circumstances have left the student at an unfair disadvantage. Students can petition for a one semester extension during the first week of the semester.
5. Evaluation: Each subject area examiner will have a distinct vote (pass/fail) and each student must receive **two pass votes** in order to pass each subject area. A student must retake a subject area if two fail votes are received. In the event of a split vote, either (a) the student will receive a fail for that subject area and must retake that written exam, or (b) the examiners have the option to schedule an in-person, oral follow-up session and decide the final outcome (pass/fail).
  - a. The follow-up session must occur no later than 1 week following the written exam and may be up to 45 minutes per topic.
  - b. Some divisions may require a mandatory follow-up oral component to the written exam in some subject areas. Specific information on such a mandatory follow-up will be provided to students at the time of confirmation of their qualifying exam subjects from the graduate academic advisor.

6. **Results:** A student must pass both subject area written exams in order to pass the written component of the qualifying exam.
7. **Retakes:** Students will have two consecutive chances to take the written exam. If a student does not pass the exam on the first chance, that student will have a second chance the next regular semester to pass. If that student does not pass the exam on the second try, the student will be dismissed from the Department's doctoral program.

**Table 4: Written Exam Subject Areas**

<i>Organizing Group</i>	<i>Subject Area (Relevant Course)<sup>1</sup></i>
Design, Ergonomics, Manufacturing and Systems	<b>Design</b> (based on graduate level understanding of topics covered in ME EN 3000) <b>Manufacturing</b> (based on graduate level understanding of material covered in ME EN 2650)
Robotics	<b>Robotics</b> (ME EN 6220) <b>Classical Control Systems</b> (ME EN 6200) <b>System Dynamics</b> (ME EN 6205)  <i>*Students enrolled in the Robotics Track must take the Robotics exam. The other exam must be Classical Control Systems or System Dynamics.</i>
Solid Mechanics	<b>Advanced Strengths</b> (ME EN 6300) <b>Finite Element Analysis</b> (ME EN 6510) <b>Continuum Mechanics</b> (ME EN 6530) <b>Biomechanics</b> (ME EN 6540) <b>Composites</b> (ME EN 6520) <b>Fracture</b> (ME EN 7530)
Thermal Fluids and Energy Systems	<b>Fluid Mechanics</b> (ME EN 6700) <b>Heat Transfer</b> (ME EN 6960) <b>Thermodynamics</b> (ME EN 6600)

#### *Oral Examination*

1. **Content:** The oral presentation during the Ph.D. Research Proposal Defense constitutes the oral component of the Ph.D. Qualifying Exam. Students must have passed the Canvas plagiarism quiz before the proposal defense. Any student who has not fulfilled this requirement will automatically fail the oral component of the qualifying exam and this will count as one of the student's attempts. (*Refer to Section IV of the Graduate Handbook for more details and requirements for the Ph.D. Research Proposal Defense*)
2. **Committee:** The student's supervisory committee serves as the examining committee for the oral component of the qualifying exam.
3. **When to take the oral exam:** Students must take the oral exam within two semesters after passing the written exam. Summer does not count as a semester. Students will work with their supervisory committee to determine a defense date and time. Students must schedule the oral exam/defense with the Graduate Advisor at least two weeks prior to the exam.
4. **Evaluation:** All members of the supervisory committee must vote pass on the oral presentation during the Proposal Defense in order for the student to pass the oral

<sup>1</sup> Where graduate courses are listed, it is also expected that the student is competent in his/her understanding of the underlying fundamental content covered in the corresponding undergraduate course(s).

component of the exam. A student may either fully pass the exam, pass the exam with corrections or conditions from the committee, or fail the exam. A student must perform the proposal defense over if any one member of the supervisory committee votes a fail on the exam.

### **Prior to the Exam: Detailed Procedures**

1. **Student Preparation:** It is expected that prior to the examination semester, students will complete requisite coursework to achieve competency in the qualifying written exam subject areas.
  - a. **Notification of Intent:** Students register for the exam each semester by submitting a form <https://mech.utah.edu/files/2018/07/Quals-Notification-of-Intent-form.pdf> signed by the student's advisor
2. **Subject Areas:** The two subject areas must come from Table 4.

### **After the Exam: The Faculty Meeting**

1. At the first regularly scheduled faculty meeting following the exams, the outcomes will be presented by the Director of Graduate Studies with a brief opportunity for the faculty to ask for any necessary clarifications.
  - a. For any students failing the exam retake, the student's advisor will be allowed to address the faculty. The advisor will state what recommendations he or she feels appropriate, then provide evidence to support this action.
  - b. Barring any objections, the faculty will move directly to a vote *only* on the results of students who have failed the retake of the exam based on the committee's recommendations of pass, conditional pass, partial pass, or fail.
  - c. A majority vote is required for approval.
2. In the case of conditional passes:
  - a. The conditions must be met in a timely manner, not to exceed 1 year from the exam date.
  - b. When the conditions have been met, with the faculty advisor's endorsement, the student will request a change in status from "Conditional Pass" to "Pass." The Director of Graduate Studies will act on the request.
3. After faculty approval has been obtained, the Graduate Advisor will prepare letters containing final exam results (including explanation of conditions, if applicable) to be mailed to the students no later than the end of the 16<sup>th</sup> week of the semester.

**SECTION IV: PHD PROPOSAL AND DISSERTATION DEFENSE  
SUMMARIES**

## Proposal Defense and Dissertation Defense Summary Requirements

- The proposal defense and dissertation defense summaries are required. All Ph.D. candidates will be required to submit the following documents with their research manuscripts according to the timeline in Section II.

### Ph.D. Timeline

- **Milestone 1: Ph.D. Qualifying Exam**
  - Take exam during the 3<sup>rd</sup> semester of Ph.D. program
- **Milestone 2: Proposal Defense and Summary**
  - The proposal defense must be completed within two semesters after passing the written component of Ph.D. Qualifying Exam. Summer does not count as a semester.
  - The proposal defense is comprised of three parts: a written proposal, a public oral presentation and a closed oral defense of the proposal.
  - The student is required to submit a written research proposal and proposal summary to the supervisory committee 2 weeks prior to the proposal defense.
  - Written research proposal requirements:
    - Must follow standard format such as those suggested by NSF, DOE, NIH, or other funding agencies as appropriate.
    - Must include a one-page summary. May include a budget, two-page bio-sketch.
    - Project description must be 15 pages or less and include a time table.
  - The proposal summary requirements.
    - Provide a succinct, one-page description of what your Ph.D. research will accomplish.
    - Your supervisory committee will have a clear understanding of your overall plan and approach after reading this one-page summary.
    - To be submitted with the written research proposal to the supervisory committee 2 weeks prior to the proposal defense. If the committee suggests changes, a revised and approved version must be submitted to the Graduate Advisor within 2 weeks of the proposal defense date.
- **Milestone 3: Dissertation Defense and Summary**
  - There must be a minimum of 8 months between the proposal defense and the dissertation defense.
  - The student is required to submit a dissertation manuscript and dissertation summary to the supervisory committee 2 weeks prior to the dissertation defense.
    - Manuscript requirements:
      - See the Thesis Office Requirements
    - The dissertation defense summary requirements
      - Provide a succinct, one-page description of what you have accomplished through your research. A second page should outline deliverables achieved.
      - Your supervisory committee will have a clear understanding of the contributions you have made.
      - To be submitted with the manuscript to the supervisory committee 2 weeks prior to the dissertation defense.

- Because the department values timely dissemination of results, some portion of the dissertation must have been submitted for publication in a committee approved, peer-reviewed journal at the time of the defense. Yet, faculty members may have differing publication requirements for their students. Therefore, in some cases, students may not qualify to defend until they have met these publication requirements.
- **Milestone 4: Manuscript Corrections**
  - After completion of the dissertation defense, the student must complete any content recommendations by the supervisory committee.
  - Once content is in order, the student must collect original signatures of all committee members on two copies of the Reading Approval Sheets. Students then submit approval sheet and one hard copy of the manuscript to the Department Chair for approval.
  - Student must work with Thesis Editor to correct format of the manuscript.
  - Dissertation must be approved by Thesis Editor no later than eight months from the date of the dissertation defense. This eight-month deadline includes dissertation corrections, final supervisory committee approval, department chair approval, and final approval by the thesis office and graduate school. If this requirement is not met, any prior approvals of the dissertation will be voided, the student will have to re-register for one dissertation credit, and re-submit and re-defend the dissertation.

## **SECTION V: STUDENT BENEFITS**

## FINANCIAL SUPPORT

Financial support for graduate students comes primarily from one of three separate sources: Research Assistantships (RA), Teaching Assistantships (TA), and fellowships. Additional support is provided through the Tuition Benefit Program (TBP).

### Research Assistantships

RA positions are available to students working on grant-funded research programs. Awards are made directly by the faculty involved in the research. RA positions are considered half-time (20 hrs/week) positions. Partial RA positions may be awarded by faculty with a corresponding decrease in hourly expectations. The amount of the RA stipend is determined by the funding faculty member. Availability of research funds varies from semester to semester and new graduate students are strongly encouraged to discuss potential research projects with members of the faculty involved in research consistent with the student's interests.

### Teaching Assistantships

TA assignments are generally made by faculty members teaching courses that have TA positions assigned to them. Annually, the Department retains several full-year TA positions for new students entering the program.

### *Duties*

TAs may run laboratory sessions, give classroom lectures, hold office hours, and be involved in grading. The Department classifies classroom assistant positions into three categories:

- **Lab TAs** are typically responsible for all aspects of laboratory sections associated with certain undergraduate courses. Duties may include the set-up of experiments, lectures to undergraduate students on particular experiments, supervising undergraduate students during the data acquisition phase of experiments, and grading lab reports.
- **Course TAs** typically assist with course instruction. Duties may include conducting problem sessions, occasional lecturing, and grading of student homework and projects.
- **Graders** have limited interaction with undergraduate students and are primarily responsible for grading homework.

### *Stipend amount*

Expected work load and stipend information for each type of TA position is given in Table 5.

**Table 5: TA and Grader Stipends and Work Levels**

Title	Support Level*	Maximum work load (hr/week)	Student Contact
Lab TA	100%	20	Yes
Course TA	50%	10	Yes
Grader	50%	10	No

\*Current support level amounts can be found here: <https://gradschool.utah.edu/tbp/tbp-minimum-support-amounts-and-deadline-calendar/>

### *International students and TA positions*

In order to qualify for a TA position, international students must attend the International Teaching Assistant (ITA) workshop in their first semester. The Graduate School requires all non-

native English-speaking graduate students to be cleared by the ITA Program in order to be eligible for a tuition benefit for teaching assistantships. The clearance process includes screening for oral English proficiency and either on-line or in-person training and workshops to prepare ITAs for their teaching assignments. On-going training and support is offered throughout the academic year in the form of graduate-level English classes, one-on-one and group tutorials, classroom observations with follow-up consultations, mid-semester student evaluations, and seminars on topics of interest to ITAs.

#### *Summer teaching positions*

Occasionally, instructor positions are available each summer semester for advanced Ph.D. students. The graduate student/instructor is given full responsibility for a course, including lecture preparation and delivery, test creation and grading, student advising on course material, and all course administration. The graduate student/instructor is provided a mentor from the regular faculty who provides advice and guidance on all aspects of course management. These positions provide the opportunity for Ph.D. students interested in an academic career to gain experience in teaching. Remuneration is based on the class level and number of students registered for the class.

#### **Fellowships**

The Graduate School has fellowships that are available to graduate students on a competitive basis. Complete information regarding these fellowships can be found on the Graduate School web page (<https://gradschool.utah.edu/tbp/graduate-fellowship-opportunities/>).

The College of Engineering also has a number of fellowships available for graduate students (<https://www.coe.utah.edu/students/fellowships/>). These fellowships are awarded on a competitive basis and applications are generally required early in the spring semester.

#### **Tuition Benefit Program**

TBP provides tuition waivers to graduate students who are receiving a minimum amount of funding through assistantships and/or fellowships. All students receiving a tuition benefit must meet minimum financial support requirements paid through the University of Utah for each semester that a benefit is received. Minimum support levels can be found here: <https://gradschool.utah.edu/tbp/tbp-minimum-support-amounts-and-deadline-calendar/>:

No tuition benefit is granted to students receiving less than the 50% level of support for the semester. The required minimum support level is annually indexed to general salary increases to prevent gradual erosion of established graduate student salaries and stipends. Tuition Benefit does not cover differential tuition, undergraduate tuition, or tuition for audited classes. Further information on the Tuition Benefit Program may be found at the Graduate School website (<http://www.gradschool.utah.edu/>).

#### **How to participate**

1. Students meeting one of the minimum stipend amounts must fill out a Tuition Benefit Enrollment form.
2. The form is turned in to the Graduate Advisor. Grad Fellows must submit this form prior to the end of the prior semester. All others must submit this form by the end of the first week of the new semester. A new form must be submitted every semester.

3. Students must then check with the ME EN Admin Manager to verify that they are on the payroll for the correct stipend amount. First-time employees must also fill out new hire paperwork.
4. After the census deadline of each semester, students must accept the way the waiver was applied to their tuition in CIS. Failing to complete this step can result in loss of waiver and a retroactive tuition charge.

## **GRADUATE STUDENT HEALTH INSURANCE**

The university also provides for health insurance for graduate students via two plans: the Subsidized Plan and the Voluntary (Unsubsidized) Plan. Enrollment is not compulsory, merely available to those who are eligible and wish to use this benefit. Further information on the insurance plans is available at [www.gradschool.utah.edu/index.php](http://www.gradschool.utah.edu/index.php) under the Fellowships and Benefits menu item.

### **Subsidized Health Insurance**

Full-time RAs and TAs (20 hr per week assignment) are eligible to enroll in subsidized student health insurance, which provides an 80% subsidy of the annual premium for a basic student accident and sickness insurance plan offered by the University of Utah. The plan allows students add a spouse and/or children at the student's own expense.

#### *How it works*

1. Eligible RAs and TAs enroll in the health insurance when they turn in their Tuition Benefit Enrollment form.
2. Students desiring to add family members or to increase coverage need to fill out additional paperwork.
3. The Graduate School will pay 80% of the premium for basic single-student coverage at the time of enrollment.
4. The student's portion (20%) is paid by the student in Income Accounting.
5. Fall insurance coverage is from 8/16-12/31. Spring/Summer coverage is from 1/1-8/15.

### **Unsubsidized Health Insurance**

The same level of coverage available to RAs and TAs is also available to all graduate students through the Voluntary Health Insurance Plan. This health insurance is unsubsidized, meaning students must pay the entire premium themselves. Students can find more information here: <https://gradschool.utah.edu/tbp/insurance-information/>.

## **SECTION VI: INDEX OF POLICIES**

## IMPORTANT POLICIES

The policies below are a selection of procedures and expected conduct for earning a graduate degree in Mechanical Engineering. The policies listed are not meant to be an exhaustive list. Other policies (including, but not limited to, the Graduate School, the Registrar's Office, and the University at large) must also be adhered to, but are not necessarily detailed herein.

### **Amending the Program of Study**

Modifications to the program of study are implemented by submitting a new committee approved program of study form.

### **Changing Degree Programs**

All master's level students are expected to declare a degree program (thesis or non-thesis) by their second semester of graduate study. Students wishing to change their degree program must submit a new *Program Declaration* form. The chair of the supervisory committee must sign this form before it is submitted.

### ***Direct Advancement to the Ph.D.***

Students completing a master's degree may continue their studies directly into the Ph.D. degree with the support of their supervisory committee. Change in classification from a master's to a Ph.D. student will not be granted before successful defense of the master's thesis, or, in the case of the M.S. (non-thesis) degree, successful completion of the comprehensive exam. Such students should also fill out and submit the *Change of Graduate Classification* form.

### **Charges**

Nonresident tuition is not imposed on any student (including international students) whose total registration includes only course numbers in the ranges 6970-6989 and 7970-7989 in a given semester. These classes include master's thesis, doctoral dissertation, faculty consultation, and continuing registration.

### **Course Grades**

The grade point average for all courses used to satisfy degree requirements must be 3.00 or better, and no course that was graded below "B-" can be counted as credit towards the degree. Independent study, thesis, project, and dissertation hours are graded CR/NC in the Department. 'T' grades must be changed to CR/NC as quickly as possible.

If a professor does not turn in a grade by the grading deadline, the grade will default to 'EU.' 'EU' means "unofficial withdrawal," i.e., no work was done by the student and/or no grade was recorded by the professor. EU grades are factored into the GPA as a failing grade.

Students need to monitor their grades closely via CIS and notify their professors of any T or EU grades. Professors will need to use appropriate forms to change the grade. Students cannot graduate with any EUs or Ts, even if the ungraded class is not being used toward a degree.

### **Course Level**

Graduate students are required to take courses offered simultaneously at 5000/6000 levels at the 6000 level. Counting any 5000 level courses towards the degree requires approval by the supervisory committee and formal petition to the Director of Graduate Studies. Graduate course

work in allied fields is allowed. A class is considered graduate-level according to that department's policies. For example, the Math Department considers some 5000-level math classes to be graduate-level, and they will be counted as such in our Department. Allied fields are typically considered those from engineering, science, and mathematics. Classes in English as a Second Language (ESL) are not considered to be from an allied field. Courses taken at the University of Utah at the 5000 level may not be retaken at the 6000 level for credit.

### **Coursework**

Courses are approved for a degree first by the student's supervisory committee, then by the Director of Graduate Studies, and finally by the Dean of the Graduate School. Classes should be chosen in conjunction with a student's faculty advisor. An advisor may require a student to take a class that will not count toward the degree (such as an undergraduate class or a class not from an allied field). This is the advisor's prerogative.

### **Degree Completion**

All graduate program forms must be submitted to the Graduate Advisor no later than one semester prior to graduation. Graduation is initiated by the student by filling out the Application for Graduation form and submitting it to the Graduation Office by the posted deadlines.

Degrees will not be awarded until:

1. All grades have been posted
2. There are no T or EU grades
3. The culmination event has occurred (final exam for MSNT, successful passing of the defense for all others)
4. All manuscript corrections have been made to the satisfaction of the supervisory committee and the Thesis Editor (MST and Ph.D. only)
5. All paperwork has been submitted and approved

### **Department Mailing List**

All Department communications are sent via email to the graduate listserv [me-grads@mech.utah.edu](mailto:me-grads@mech.utah.edu). It is the student's responsibility to check, read and understand the email messages sent out. Staff are not responsible for any consequences incurred due to negligence on the student's part.

### **Exceptions**

Any exceptions to these guidelines must be approved by the Department Graduate Committee through a formal petition.

### **Full-time Status**

Graduate students are considered full time if

1. They are registered for 9 or more credit hours, OR
2. After residency requirements have been met (two consecutive semesters of 9 hours or more) they are registered for 3 credit hours of courses, at least one credit hour of which must be in the range of 6970-6989 or 7970-7989 (excluding 6980 and 7980, which are only for students that have defended their thesis/dissertation).

### **Leave of Absence**

A leave of absence must be requested any time a student plans on not registering for a fall or spring semester. Leaves are requested by filling out a *Leave of Absence Form*. The student and his or her faculty advisor both need to sign the form. The form must be submitted to the Graduate

Advisor during the semester for which the leave is to take place. Leaves up to one year at a time may be requested. Without a formal leave of absence, the student's graduate level status is canceled, and re-application to the program and payment of all applicable fees is required.

### **Maximum Hours**

No student for a graduate degree is permitted to register for more than sixteen (16) hours in any single semester. Exceptions to this policy must be approved by the Director of Graduate Studies and the Dean of the Graduate School.

### **Minimum Continuous Registration**

All graduate students must maintain continuous registration from the time of formal admission as a graduate student through completion of all requirements for the degree they are seeking, unless granted an official leave of absence by the Graduate School. This means a student must be enrolled at the University every fall and spring semester. Continuous registration requirements do not apply during the summer term.

Students can maintain minimum registration by registering and paying normal tuition and fees for at least 1 credit hour per semester of regular courses, research hours, or faculty consultation hours unless more credits are required to fulfill other policies set forth by the Graduate School, the tuition benefit program, requirements for international students, or Financial and Business Services (see links below). Students must be registered for research credit hours (6975 and 7970) during the semester they defend their final thesis/dissertation.

*Graduate School Catalog;* <http://gradschool.utah.edu/graduate-catalog/>  
*Tuition Benefit Program Guidelines;* <http://gradschool.utah.edu/tbp/tuition-benefit-program-guidelines/>

## **REGISTRATION REQUIREMENTS**

Students participating in the TBP must be full-time, matriculated graduate students in good standing, with a cumulative GPA of at least 3.0. Students on academic probation are not eligible for a Graduate School tuition benefit. TBP full-time student status means registration for at least nine credit hours throughout the semester. This provision does not affect full-time definitions or requirements currently employed for the purpose of loan repayment, student insurance, or other reporting requirements. TBP covers a minimum of 9 to a maximum of 12 credit hours, except for RAs whose tuition benefit is a minimum of 9 and a maximum of 11 credit hours, in Fall and Spring semesters and 3 credit hours in Summer semester. For RAs who have exceeded 84 accumulated credit hours, resident (in-state) tuition only is included in the TBP. This condition will be implemented in the semester when cumulative registration exceeds 84 credit hours as a University of Utah graduate student. Undergraduate, contract, and/or audited courses count toward the required minimum nine credit hours but do not qualify for a tuition benefit. A student registered for fewer than nine credit hours may make up the difference by registering for 6975 or 7970 or other appropriate graduate credit. Students may register for a maximum 16 semester hours but are responsible for tuition for hours exceeding 12 credits. Students adding and/or dropping courses after the semester's published add/drop deadlines are responsible for any and all charges incurred, including withdrawals. If registration falls below nine credit hours at any time during the semester, a student becomes ineligible for TBP participation and will be billed the full tuition for that semester.

Doctoral students not using University facilities or faculty time should register for Continuing Registration (ME EN 7990) to fulfill this requirement. Please note that ME EN 7990 does not fulfill full-time status and graduate degree requirements.

If a graduate student does not maintain continuous registration, the Registrar's Office classifies the student as inactive and the student's graduate status is cancelled. In this case, students are required to reapply for admission, and to pay all relevant application fees in order to continue their studies.

*International Center Guidelines;*

<http://internationalcenter.utah.edu/students/immigration-status/maintaining-status.php>

Graduate Students must be registered for a minimum of 9 credit hours or 3 thesis credit hours per semester. Students who are enrolled in 3 thesis credits are considered to have fulfilled the on-campus requirement.

F-1 students must take the minimum credits each semester except during vacation semester (i.e., Summer) and final semester. Please note that not all programs and degree tracks offered by the University of Utah meet the minimum credit requirement. Because you have to meet the minimum requirement of full-time hours each semester except during the vacation and final semesters, certain programs offered on campus and certain employment opportunities outside of campus are incompatible with the F-1 student regulations.

*FICA Tax Guidelines;*

<http://fbs.admin.utah.edu/tax-services/common-university-tax-issues/student-employee-fica-exclusion/>

Graduate students must be: enrolled and registered for 3 or more credit hours in the current semester at the University of Utah AND employed at the University of Utah as a part-time employee assigned to work less than 30 hours per week in a position not eligible for benefits. (Total FTW can't be over .74)

If a student works at the University of Utah during the summer semester, s/he must be enrolled and registered at the University of Utah as a student for the above stated credit hours during the summer semester in order to qualify for Student-Employee FICA exclusion.

**Non-matriculated Students**

Students who do not qualify for admission to The Graduate School or non-degree-seeking students may enroll in graduate-level classes on a non-matriculated basis. "Non-matriculated" means a student is simply taking classes, but not actively seeking a degree at that time. A student might open a non-matriculated career in order to catch up on undergraduate prerequisites, to take some graduate-level courses in order to improve their application for admission, or to get started on their graduate courses while waiting to finish their application for admission.

*Requirements for a Non-Matriculated Status*

1. Applicants must be U.S. citizens with a bachelor's degree. International students on visas are not eligible for non-matriculated status.
2. Applications for non-matriculated status are processed solely through the Admissions Office. Applications must be submitted by the posted deadlines.

3. Up to nine credit hours of non-matriculated credit may be applied to a graduate degree.
  - a. Such credits must graduate-level and be graded with a B- or better.
  - b. Decisions on accepting course credit are made by the student's supervisory committee once the student has matriculated.
4. When such students want to be considered for matriculated graduate status, they must apply formally through the Admissions Office and College of Engineering, as previously outlined.
5. Grades received during non-matriculated status do not guarantee admission into a graduate program.
6. To transfer the non-matriculated credits to a degree program, students must fill out and submit a form: <https://gradschool.utah.edu/wp-content/uploads/2013/04/non-matriculated-CH-form.pdf>.

#### *Registering for a Class as a Non-Matriculated Student*

1. The student must open a non-matriculated career by filling out the appropriate paperwork with the Admissions Office
2. Once the career is open and active, a student may begin registering themselves for classes through CIS.
3. Some courses (upper-division and graduate-level, in particular) are restricted because of full enrollment, limited space, prerequisites, etc.
4. To enroll in a restricted upper-division ME EN course, the student should contact the Department's Undergraduate Advisor, who will grant the student access.
5. To enroll in a restricted graduate-level course, the student should contact the professor of the course for a permission code.
6. Permission codes can be used by the student in the online registration system or by contacting the Registration Office.

#### **Other Requirements and Guidelines**

Requirements and guidelines for all graduate programs can be found online at the Graduate School website, <http://www.gradschool.utah.edu/index.php>. All graduate students within the Department must, at a minimum, follow the Graduate School Schedule of Procedures. In some cases, Department procedures may deviate slightly from those of the Graduate School (particularly in terms of due dates for important documents). In these cases, students are expected to adhere to the Department deadlines.

#### **Paperwork**

It is the responsibility of the student to understand all forms and deadlines relating to their degree. It is further the responsibility of the student to fill out and obtain signatures for his or her paperwork. Students should not ask faculty, staff or fellow students to manage their forms for them.

The progress of all paperwork can be tracked through CIS. Forms relating to the degree can be tracked through the Graduate Student Summary. Forms relating to benefits (tuition waivers and subsidized health insurance) can be tracked through the Tuition Bill link in CIS.

Degree forms must be approved twice: first by original signature on the paper form, then by electronic signature in the online tracking system in the Graduate Student Summary. It is the responsibility of the student to ensure that both sets of signatures are on their paperwork.

## **Plagiarism**

From the University of Utah Student Code (Code of Rights and Responsibilities):

“Academic misconduct” includes, but is not limited to, cheating, misrepresenting one's work, inappropriately collaborating, plagiarism, and fabrication or falsification of information, as defined further below. It also includes facilitating academic misconduct by intentionally helping or attempting to help another to commit an act of academic misconduct.

“Plagiarism” means the unacknowledged use or incorporation of any other person's work in, or as a basis for, one's own work offered for academic consideration or credit or for public presentation. Even unintentional falsification or any other unintentional misrepresentation of one's work is considered to be a form of academic misconduct unless reasonable due diligence was conducted to affirm originality of work and data as one's own. Plagiarism includes, but is not limited to, representing as one's own, without attribution, any other individuals' words, phrasing, ideas, sequences of ideas, information, or any other mode or content of expression.

Plagiarism and other kinds of academic misconduct are not tolerated in the Department of Mechanical Engineering. All graduate students will be required to read an online plagiarism module and to pass a quiz.

### *Consequences of Plagiarism*

Students caught plagiarizing material, even accidentally, will have a letter placed in their student file. Repeat offenders will be evaluated by the Graduate Committee, with potential consequences ranging from failure of the assignment, failure of the entire course, withdrawal of funding support, and – in extreme cases – expulsion from the program.

Plagiarism in the Ph.D. qualifying exam is also not tolerated. If the Ph.D. qualifying exam committee determines that a student has plagiarized, the student will fail the entire qualifying exam and a letter will be placed in the student file. Further action may be taken as deemed necessary by the Graduate Committee.

Please see the University Student Code and department policy (<https://mech.utah.edu/files/2018/08/ME-Academic-Misconduct-Policy1.pdf>) for further information.

### **Academic Probation Policy**

If the cumulative GPA falls below a 3.0 then a student is on academic probation. A student on academic probation must obtain at least a 3.0 every semester until their cumulative GPA is a 3.0 or above. If a student's semester GPA falls below a 3.0 GPA and the student is on academic probation and not making progress towards improving their GPA, the student will be dismissed from the graduate program.

### **Probation for Failure to Make Due Progress Policy**

If a student fails to make progress towards their degree (e.g., not forming committee, not performing proposal defense, etc.), he or she will be placed on Probation for Failure to Make Due Progress. If at the end of the second semester on probation, the student has not adequately satisfied all delinquent milestones, the student will be dismissed from the graduate program.

### **Regular Courses/Special Topics/Seminar Classes**

“Regular courses” are graduate courses that have regular class meetings, lectures, and/or labs. These courses have permanent course numbers in the range 6000-6899 and 7000-7899. Courses

taken at the University of Utah at the 5000 level may not be retaken at the 6000 level for credit. Seminars (Fluids, Robotics, etc.) may count for up to 3 credit hours towards one degree at the discretion of the student's supervisory committee. The class counts towards the minimum ME EN course credit requirements but not the 7000-level requirement. The class also counts toward the independent study limit.

Special Topics courses (ME EN 6960 and 7960) are considered regular courses since they have regular class meeting and lectures. Special Topics courses may be counted more than once to satisfy degree requirements so long as each class represents a distinct special topics course.

Independent Study and seminar classes do not count as "regular" courses; only 3 credit hours total (6 hours for Ph.D. post B.S.) of these classes may be counted toward a degree. Unless otherwise approved by the Graduate Committee, an independent study must not comprise of only thesis research and must culminate in a tangible outcome (such as a final exam, a paper, or a project).

Faculty Consultation (course number 6980 or 7980) is only for MST and Ph.D. students that have defended their thesis/dissertation but still wish to continue their student careers (e.g., publishing research in journals). Faculty Consultation cannot be used in lieu of an Independent Study, does not count toward thesis hours or the fulfillment of degree requirements, and may not be listed on the program of study.

### **Retention of Application Materials**

New graduate students who do not enroll the term they are accepted may defer their admission for one semester without penalty. After one semester, students must fill out the university application again and repay the application fee. The regular Department admissions deadlines apply.

Files for new students who do not enroll are kept for one year. Files not reactivated within one year are destroyed. Any subsequent application is treated as a new student application.

### **Thesis/Dissertation Guidelines**

Information on guidelines for writing and formatting master's theses or doctoral dissertations are available from the Thesis Editor in the Graduate School or online at <http://www.gradschool.utah.edu/thesis/index.php>. Students are expected to follow the *Style and Format Guides* in composing their thesis or dissertation.

### **Thesis/Dissertation Correction Deadline**

Proficient graduate students typically finish manuscript corrections with the University Thesis Editor within four to eight weeks of their defense. Thus, taking an entire semester to work on corrections is typically unnecessary and is discouraged by the Department. Thesis office approval should be completed no later than eight months from the date of the thesis/dissertation defense. This eight-month deadline includes thesis/dissertation corrections, final supervisory committee approval, department chair approval, and final approval by the thesis office and graduate school. If this requirement is not met, any prior approvals of the thesis/dissertation will be voided, the student will have to re-register for one thesis/dissertation credit, and re-submit and re-defend the thesis/dissertation.

### **Time Limits**

Table 6 shows the time limits for each degree. Leaves of absence do not count toward the time limit. Classes taken during a non-matriculated career do not count towards the time limit.

On recommendation of the student's supervisory committee and the Director of Graduate Studies, the Dean of the Graduate School or the Associate Dean for Academic Affairs of the College of Engineering (as appropriate) can modify or waive this requirement in meritorious cases.

**Table 6: Degree Time Limits**

<b>Degree</b>	<b>Time Limit</b>
Master of Science	4 consecutive calendar years
Doctor of Philosophy	7 consecutive calendar years

### **Transfer Credit**

A maximum of 6 transfer credit hours may be accepted for the program of study. Students must complete a [Graduate Transfer Credit Authorization](#) form and submit this form to the Graduate Advisor. Transcripts must be sent directly to the Graduate Admissions Office in order for them to be considered official. Please see the chapter on transferring credit for full policies and procedures.

## **SECTION VII: STUDENT RESOURCES**

## HOW TO TRANSFER COURSES FROM ANOTHER UNIVERSITY

### Transfer Policies

- Transfer classes must be classified as graduate level by the university at which they were taken.
- Classes must be graded at a B or higher and cannot be counted toward another degree.
- Up to 6 credit hours (typically 2 courses) may be transferred.
- Because of the time it takes to process transfer requests, it is recommended that students not take transfer classes during their final semester of study. Doing so can delay the awarding of the degree.

### Transfer Procedures

1. The transfer class must first be completed and graded. If class is in progress, please wait until the completion of the class before beginning the transfer process.
2. Obtain an official transcript from the transferring university and mail it to the University of Utah Admissions Office. Make sure the transcript includes the final grade for the class.
3. Fill out the Graduate Transfer Credit form, obtain your chair's signature, and submit the form to the Graduate Advisor.
4. The Graduate Advisor will forward your request to the appropriate faculty members in order to evaluate whether the class is transferrable. You may be asked to provide a copy of the class syllabus or other information about the course or university.
5. If the class is approved for transfer at the department level, the form will be sent to the Graduate School to have the class approved at the University level.
6. If the Graduate School approves of the transfer course, the course will be available for transfer. It will appear in CIS in your Graduate Student Summary, under the Program of Study tab, in the Transfer Classes section.
7. Last, you must get the approval of your committee to count the class for your degree. List the transfer class on your paper Program of Study with all of your other credit hours for your degree and ask your committee to approve it.

## **SAFETY AND WELLNESS**

Your safety is our top priority. In an emergency, dial 911 or seek a nearby emergency phone (throughout campus). Report any crimes or suspicious people to 801-585-COPS; this number will get you to a dispatch officer at the University of Utah Department of Public Safety (DPS; <https://dps.utah.edu/>). If at any time, you would like to be escorted by a security officer to or from areas on campus, DPS will help - just give a call.

The University of Utah seeks to provide a safe and healthy experience for students, employees, and others who make use of campus facilities. In support of this goal, the University has established confidential resources and support services to assist students who may have been affected by harassment, abusive relationships, or sexual misconduct. A detailed listing of University Resources for campus safety can be found at <https://registrar.utah.edu/handbook/campussafety.php>.

Your well-being is key to your personal safety. If you are in crisis, call 801-587-3000; help is close.

The university has additional excellent resources to promote emotional and physical wellness, including the Counseling Center (<https://counselingcenter.utah.edu>), the Wellness Center (<https://wellness.utah.edu>), and the Women's Resource Center (<https://womenscenter.utah.edu>). Counselors and advocates in these centers can help guide you to other resources to address a range of issues, including substance abuse and addiction.

## RESOURCES AROUND CAMPUS

The University is divided into several different departments, each with their own focus and specialized knowledge. It is the student's responsibility to know who to go to for specific assistance. Table 7 describes some of the most common on-campus resources. More resources can be found via the University A-Z Index.

**Table 7: Common On-Campus Resources**

Enquiry	Resource	Web Address	Contact Method
Tuition rates and bill estimates	Income Accounting	<a href="http://fbs.admin.utah.edu/income/tuition/tuition-calculator/">http://fbs.admin.utah.edu/income/tuition/tuition-calculator/</a>	Call: (801) 581-7344 Visit: 165 SSB
Tuition bill – view and pay	CIS	<a href="http://www.cis.utah.edu">http://www.cis.utah.edu</a>	Web Address
Projects and funding	Individual professors	<a href="http://mech.utah.edu/faculty/">http://mech.utah.edu/faculty/</a>	Varies
Paycheck/stipend amount	ME EN Admin Manager	<a href="http://www.cis.utah.edu">http://www.cis.utah.edu</a>	Visit: 1561 MEK
Coursework recommendations, requirements, and approval	Your faculty advisor or the Director of Grad Studies	<a href="http://mech.utah.edu/faculty/">http://mech.utah.edu/faculty/</a>	Varies
I-20 matters	International Admissions	<a href="http://admissions.utah.edu/international/graduate/index.php">http://admissions.utah.edu/international/graduate/index.php</a>	Visit: 250 SSB
Visa matters	International Center	<a href="http://www.ic.utah.edu/">http://www.ic.utah.edu/</a>	Visit: 410 Union
Forms and deadlines	ME EN Graduate Advisor	<a href="http://mech.utah.edu/academics/grads/">http://mech.utah.edu/academics/grads/</a>	1568 MEK

## USEFUL WEBSITES

A-Z Website Index:

<http://www.utah.edu/a-z/>

Mechanical Engineering Graduate Program:

<http://mech.utah.edu/academics/grads/>

College of Engineering:

<http://www.coe.utah.edu/>

Graduation Overview for Master's Candidates:

<http://gradschool.utah.edu/current-students/graduation-overview-for-masters-candidates/>

Graduation Overview for Doctoral Candidates:

<http://gradschool.utah.edu/current-students/graduation-overview-for-doctoral-candidates/>

Career Services:

[www.careers.utah.edu](http://www.careers.utah.edu)

[http://www.coe.utah.edu/student\\_jobs](http://www.coe.utah.edu/student_jobs)

Class Schedule and General Catalogue:

<http://www.utah.edu/students/catalog.php>

Conference Travel:

<http://gradschool.utah.edu/current-students/graduate-student-travel-assistance-award/>

<http://fbs.admin.utah.edu/travel/>

<http://asuu.utah.edu/funding>

Financial Aid:

<http://financialaid.utah.edu/>

The Graduate School:

<http://gradschool.utah.edu/>

Grad School Regulations:

<http://gradschool.utah.edu/graduate-catalog/>

Graduate Subsidized Health Insurance:

<http://gradschool.utah.edu/tbp/insurance-information/>

Student Health Center:

<http://studenthealth.utah.edu/>

Libraries on Campus:

<http://www.utah.edu/libraries/index.php>

Parking and Commuter Services:  
<http://commuterservices.utah.edu/>

Thesis Office:  
<http://gradschool.utah.edu/thesis/>

Tuition Benefit Program:  
<http://gradschool.utah.edu/tbp/tuition-benefit-program-guidelines/>

Tuition Rates and Fee Information:  
<http://fbs.admin.utah.edu/income/tuition/>

University Student Handbook:  
<http://registrar.utah.edu/handbook/>

International Student & Scholar Services:  
<http://internationalcenter.utah.edu/>

## APPROVED MATH ELECTIVES

These courses are approved to fulfill elective (non-ME EN) course requirements. Electives must still be approved by the student's committee chair before they can be applied to a degree.

MATH 5010 Introduction to Probability  
MATH 5040 Stochastic Processes and Simulation I  
MATH 5050 Stochastic Processes and Simulation II  
MATH 5080 Statistical Inference I  
MATH 5090 Statistical Inference II  
MATH 5210 Introduction to Real Analysis  
MATH 5215 Applied Fourier Analysis  
MATH 5250 Matrix Analysis  
MATH 5410 Introduction to Ordinary Differential Equations  
MATH 5420 Ordinary Differential Equations and Dynamical Systems  
MATH 5440 Introduction to Partial Differential Equations  
MATH 5470 Applied Dynamical Systems  
MATH 5600 Survey of Numerical Analysis  
MATH 5610 Introduction to Numerical Analysis I  
MATH 5620 Introduction to Numerical Analysis II  
MATH 5650 Topics in Numerical Analysis  
MATH 5660 Parallel Numerical Methods  
MATH 5710 Introduction to Applied Mathematics I  
MATH 5720 Introduction to Applied Mathematics II  
MATH 5740 Mathematical Modeling  
MATH 5750 Topics in Applied Mathematics  
MATH 6070 Mathematical Statistics  
MATH 6210 Real Analysis  
MATH 6220 Complex Analysis  
MATH 6410 Ordinary Differential Equations  
MATH 6420 Partial Differential Equations  
MATH 6430 Advanced Partial Differential Equations  
MATH 6440 Advanced Dynamical Systems  
MATH 6610 Analysis of Numerical Methods I  
MATH 6620 Analysis of Numerical Methods II  
MATH 6630 Numerical Solutions of Partial Differential Equations  
MATH 6710 Applied Linear Operator and Spectral Methods  
MATH 6720 Applied Complex Variables and Asymptotic Methods  
MATH 6730 Asymptotic and Perturbation Methods  
MATH 6740 Bifurcation Theory  
MATH 6750 Continuum Mechanics: Fluids  
MATH 6760 Continuum Mechanics: Solids  
MATH 6790 Case Studies in Computational Engineering and Science  
All MATH 7000 level courses