

Graduate Student Manual

for a degree in
Metallurgical
Engineering



MATERIALS SCIENCE & ENGINEERING
THE UNIVERSITY OF UTAH

GRADUATE STUDENT MANUAL

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Foreword

The purpose of this manual is to provide information to graduate students who are considering enrolling or have enrolled in the Department of Materials Science & Engineering, so that they may better plan their studies and research during their stay at this University. As such, it is intended to supplement information found in *The University of Utah General Catalog*. In addition to the Departmental requirements listed in this manual, all the University requirements specified in the Graduate Information section of *The University of Utah General Catalog* must be satisfied. Therefore, the student should become familiar with both the Departmental and University requirements as soon as possible after they start graduate work. *The University of Utah General Catalog* contains additional useful information on areas outside the scope of the department, e.g., campus facilities and student housing.

Precedence of Policies

In the event there is a conflict between Department policy and University policy, the University policy shall take precedence.

1.0 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 (801-581-2677); this number will get you to a dispatch officer at the University of Utah Department of Public Safety (DPS; 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>,
Wellness Center, <https://wellness.utah.edu>, and
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.

Also see section 8.1.2, *Laboratory Safety and Work-Related Injuries*.

2.0 Admission

2.1 Admission to Graduate Program

Students wishing to do graduate work in the department must submit a completed application to the University of Utah (https://www.metallurgy.utah.edu/prospective/graduates/app_link.php), along with letters of recommendation, a Statement of Purpose, official transcripts of all university or college courses completed at other institutions, and official certification of degrees obtained.

Proof of English proficiency is required for international applicants. Minimum scores are 80 internet-based (IBT) on the Test of English as a Foreign Language (TOEFL), or a band score of 6.5 on the International English Language Testing System (IELTS). Scores are valid for only two years. The English proficiency requirement may be waived if the applicant is from an English-speaking country (see International Admissions for a list of accepted countries) or if the applicant is completing or has recently completed a degree from a university in the U.S. or another English-speaking country.

Graduate Record Examination (GRE) general test (verbal, quantitative, and analytical) scores are required. There is no minimum score requirement, and scores are used in conjunction with student background for assessment.

See our website or contact the Chair of Graduate Admissions for the degree in Metallurgical Engineering, Dr. Guruswamy, or Kay Argyle, Administrative Secretary, for more information.

2.2 Counseling

A beginning graduate student may receive counseling on academic issues from the departmental Graduate Student Advisor, Sara Wilson, or the Director of Graduate Studies, Dr. Guruswamy. If the student does not already have an assigned thesis advisor, the student should discuss possible research projects with all faculty members in the department and select a topic and a thesis advisor; until the student has selected a thesis advisor, the departmental Director of Graduate Studies will temporarily appoint a thesis advisor. The faculty member directing the research becomes the student's faculty and thesis advisor and Supervisory Committee Chair. It is important to note that thesis advisor and project selections usually require sponsored research funding unless the student is supported on a fellowship. Thus, project selections usually are restricted to externally funded projects.

The departmental Graduate Student Advisor advises all graduate students in the department on general program requirements and is not the student's thesis advisor. The student's thesis advisor advises the student on coursework specific to the student's Program of Study and on thesis research.

2.3 Mail Delivery

Graduate students are assigned a mail slot, usually shared with one or more other students. By University policy, the university address is for university business only. All personal mail must be sent to the student's home address, including magazine subscriptions and financial or utility statements.

3.0 Registration

3.1 Continuous Registration for Students Working toward Graduate Degrees

Every graduate student must register for every fall and spring semester until s/he completes all requirements for her/his degree. If a student does not satisfy the continuous registration requirement, her/his Supervisory Committee will be terminated.

Ph.D. students completing research or dissertation writing and no longer taking courses yet requiring consultation with faculty or otherwise using University facilities (e.g., the library) are required to take at least three credit hours each semester.

During any semester when a student is off-campus and does not enroll in regular courses, seminars, independent study, or thesis research, and yet requires consultation with the faculty, or otherwise uses University facilities, s/he must register for three credit hours of *Faculty Consultation* (MET E 6980 or 7980).

A domestic student for whom a Supervisory Committee has been appointed who is not registered as indicated above and will not be using any university research facilities or offices may meet the continuous registration requirement by registering for *Continuing Registration* (MET E 7990) and paying the Continuing Registration charge. International students are not eligible for this option. Students may register for no more than four semesters of *Continuing Registration*.

3.2 Full-Time Status

Full-time status is described in *The University of Utah General Catalog*. For international graduate students, compliance with current U.S. Immigration and Customs Enforcement (ICE) regulations requires that they maintain full-time student status. International students need to check with International Student and Scholar Services (ISS) if exceptions are needed to avoid potential difficulties with Immigration.

3.2 Registration for Thesis Research Only

Resident tuition is charged if a student's total registration includes only *Thesis Research* (6970 or 7970) and/or *Faculty Consultation* (6980 or 7980).

3.3 Registration during Semester of Final Oral Examination

During the semester in which a student takes his/her Final Oral Examination, s/he must register for three credit hours of *Faculty Consultation* (MET E 6980 or 7980).

3.4 Leave of Absence or Vacation Semester (Full Semester)

A domestic student may apply for a leave of absence if s/he does not wish to enroll a given semester. The Department and the Graduate School evaluate leave-of-absence applications. See *The University of Utah General Catalog* for details. International students are not eligible to take a leave of absence. U.S. Immigration and Customs Enforcement requires international students to take a vacation semester each summer.

3.5 Withdrawal from the University

See *The University of Utah General Catalog*.

3.6 Option for Credit/No-Credit Grading

A graduate student is granted the option, subject to the approval of his/her major department and review by the Graduate Dean, to enroll in some courses in which s/he will be graded on a credit/no credit (CR/NC) basis, rather than on a letter basis.

It is hoped that, with the CR/NC grades, a student will feel freer to extend her/his studies to areas outside his/her major or specialty and to take classes which s/he might not take if s/he had to compete with majors for a letter grade.

1. During her/his first year in the Graduate School of the University of Utah, the student, if the department concurs, may register for one class each semester on a CR/NC basis.
2. The department has maximum flexibility to work out a satisfactory program with the student. In all cases, whether the student is in his/her first year or is in advanced stages of her/his program, the choice of courses to be taken on a CR/NC basis is subject to the approval of his/her Supervisory Committee.
3. No student may elect to register for CR/NC courses in her/his major field.
4. All courses which are listed for one hour or less are graded on a simple CR/NC basis, unless the use of regular letter grades is approved by the Graduate Council.
5. A graduate student should earn a grade of "C" or better to be entitled to "credit" for those courses graded on a letter basis. Students who do not wish to register for credit, whether a letter grade or the CR/NC option, should merely audit the course.

See *The University of Utah General Catalog* for other details on this subject.

The graduate student is cautioned that it is important that s/he receive letter grades in order to build a graduate grade point average. This is especially important if the student applies for fellowships or traineeships on a competitive basis or later transfers to another institution.

3.7 Summer Registration of Graduate Students

In accordance with University Policy, a student may leave campus to work and is not required to maintain continuous registration during the Summer term. Any student who takes the Final Oral Examination during the Summer term must be registered during that Summer term.

4.0 Employment, Research & Teaching Assistantships, Tuition Benefit, & Vacation or Leave

Graduate students in most cases do not receive financial support unless working on a research project or having been awarded a fellowship. Supplemental salary is provided to students who also work as a teaching assistant/grader.

4.1 Research Assistantships

Research assistants include all graduate students assigned directly to funded research projects. Research assistants are normally selected by the Principal Investigator of the project. See your thesis advisor for what may be available.

4.2 Teaching Assistantships

Teaching assistantships involve teaching responsibilities such as grading papers, leading discussions, or serving as an instructor or laboratory supervisor. Teaching assistantships are available in the Department for selected students. The instructor for each course selects the students. If you are interested in teaching a particular course, you should meet with the instructor at least a month prior to the start of the semester. The department gives an award each year to the teaching assistant with the most favorable student feedback. The winner of the department teaching assistant award is included in the competition for the top teaching assistant award for the College of Mines and Earth Sciences.

4.3 Tuition Benefit Support

4.3.1 Qualifying for the Tuition Benefit

Teaching assistants, research assistants, and graduate fellows who meet minimum financial support requirements through the university for the academic year receive tuition benefit support from the university. Please see the department office for the current amounts and for the availability of tuition benefit support for Summer term.

Students receiving a full tuition benefit are required to work on their funded project for twenty hours per week in order to receive the benefit. Three-quarter and half tuition benefits are available for students working fewer hours. Additional work hours each week are typically needed in order for the student to meet the objectives of their thesis research.

The tuition benefit is not provided to students compensated for their work through organizations other than the University, such as internships or fellowships paid directly through another institution or agency.

All students receiving the tuition benefit from the university must be full-time matriculated graduate students. Full-time status for this purpose is defined as registration for at least nine credit hours per semester during the regular academic

year. Benefits are valid for a minimum of nine and a maximum as specified by the tuition benefit guidelines. Students whose necessary coursework is less than nine hours should make up the nine hours by registering for Thesis Research (MET E 6970 or 7970). Students who drop and/or add courses after the published university deadline are responsible for paying any fees incurred, including the tuition charges for the dropped classes. Students are responsible for paying late fees.

If a student withdraws from courses and falls below the required nine hours, receives less than the minimum required compensation for a semester, fails to provide evidence of acceptable SPEAK test scores as applicable, or in any way fails to meet the requirements and restrictions associated with any of the supported graduate student roles or Graduate School policy, the tuition benefit will be revoked and the student billed at the end of a semester for the full tuition for that semester at the applicable resident or nonresident rate. A petition for an exception for a personal emergency such as illness may be made to the Dean of the Graduate School with a letter of support from the student's Department Chair. Current minimum financial support requirements can be found at <https://gradschool.utah.edu/tbp/tuition-benefit-program-guidelines/#financial-support-requirements>. If your stipend is below these amounts, you should immediately discuss with your thesis advisor, director of graduate studies, and/or department chair.

4.3.3 Tuition Benefit Limits

Students receiving the tuition benefit have the nonresident portion of tuition waived until they have reached 84 credit hours. The Graduate School benefit then covers the remaining full, three-quarter, or half tuition costs at the in-state (resident) rate. After eighty-four credit hours, students are responsible for the nonresident portion of tuition. Domestic out-of-state graduate students who receive the tuition benefit must apply for state residency at the end of their first year of study.

Students who enter their graduate programs with a baccalaureate degree are limited to two years (or four semesters) of tuition benefit support for the completion of the master's degree, to five years (or ten semesters) for the completion of the doctorate if bypassing the master's, and to five years (or ten semesters) if continuing in the doctoral program after receiving a Master's degree from the University of Utah (two years for a master's degree plus three additional years for a doctorate).

Students who enter a doctoral program holding a master's degree may receive up to four years (or eight semesters) of tuition benefit support.

These restrictions do not limit the number of years or semesters a program, department, or college may choose to support a student in addition to this tuition benefit program. Since this benefit is provided by the university rather than the department, semesters used in a previous major count against the total. A student who receives more semesters of tuition benefit than s/he is eligible for will be billed for the tuition retroactively.

4.4 Outside Employment

Students on research/teaching assistantships, scholarships, or fellowships are not permitted to engage in regular outside employment without special permission from their Principal Investigator or Supervisory Committee Chair. Permission is granted only in hardship cases.

International students on a student visa are not permitted to work off-campus.

4.5 Vacations and Leave (within a Semester)

While the department does not specify the number of vacation days permitted, it is understood that students demonstrating quality performance may arrange with their thesis advisor for time off. It is the responsibility of the student to plan all leaves and vacations with his/her thesis advisor. Leave necessary for presentation of research work, a job interview, etc., should also be planned in advance. Any absences not approved in advance by the thesis advisor may not be compensated for if the student is funded through a sponsored project. As a general guideline, research assistants should be allowed at least 2 weeks of vacation each year if they are achieving satisfactory progress on their project. If the thesis advisor does not allow this time off, the student may appeal to the director of graduate studies and/or the department chair. If on the Tuition Benefit program, check with the payroll secretary that unpaid leave does not drop earnings below the amount necessary to qualify.

See section 3.4 for information on taking a leave of absence or a vacation semester.

4.5.1 Policy on Parental Leave

The Department of Materials Science & Engineering will reasonably accommodate the needs of its graduate assistants when they become parents or adopt a child of five years of age or younger. This applies to both mothers and fathers. A graduate assistant who becomes a parent is eligible for paid leave under this guideline. Graduate assistants desiring a new parent paid leave must submit a written request to the Department. The request should be made as soon as possible after the date of the anticipated birth or adoption is known. The decision to approve/deny the paid leave is made by the Department Chair after appropriate consultation with the thesis advisor and the Graduate School. If the leave is approved, the graduate assistant will be excused from his/her regular assistantship duties for a period of up to six weeks, or until the end of the appointment (whichever occurs first). If extended time is needed beyond the six weeks leave, written approval for an unpaid Leave of Absence must be requested, and approval obtained from the student's Thesis Advisor and Department Chair. Note that individual fellowships, such as the NSF Graduate Fellowships, may require sponsor approval for extended leaves of absence. Specific guidelines should be consulted.

During this period, students may postpone course assignments, examinations, and other academic requirements but remain active full-time students, with access to Department facilities and to faculty and staff. While students will continue to be fully funded off any existing funding sources (e.g., fellowship, assistantship) during the leave period, students will be excused from regular teaching or research duties. However, it is the student's professional responsibility to work with her/his advisor or faculty member to prepare for the absence in advance of the leave. This includes reviewing the status and continuation of research projects, adequately preparing those who will assume teaching responsibilities during the student's absence, and arranging for a smooth transition in any other responsibilities.

5.0 Financial Aid, Loans, and Graduate Fellowships

Graduate students in most cases do not receive financial aid except in the form of a position as a Research Assistant. See the previous chapter.

Students on research assistantships, teaching assistantships, scholarships, or fellowships are not permitted to engage in regular outside employment without special permission from their Thesis Advisor. Permission is granted only in hardship cases or when the outside activity would have no impact on the student's RA or TA responsibilities.

5.1 Graduate Research Fellowships

University of Utah Graduate Research Fellowships are granted to selected graduate students in all colleges and departments of the university that offer an advanced degree. For the entire university, about fifteen research fellowships are available annually.

University Research Committee Fellowships are administered in the Research Committee Office. Persons interested in the fellowships should contact the department.

Other graduate research fellowship opportunities through various foundations and federal agencies are also available. Please see the Graduate School website for more information.

5.2 National Science Foundation Graduate Fellowships

NSF Graduate Fellowships are offered for study or work leading to advanced degrees in the mathematical, physical, medical, biological and engineering sciences or in the departments of anthropology, economics, geography, history and/or philosophy of science, linguistics, political science, psychology and sociology. Graduate Fellows are selected by the National Science Foundation on the basis of ability from among persons who are citizens or nationals of the United States.

Applicants request application cards from the Graduate Fellowship Office in October, complete the cards, and send them directly to the National Science Foundation. NSF sends each applicant an application to be completed and returned to NSF by the first week in December (exact date set by NSF each year). The Graduate Record Examination is required.

5.3 Student Loans

Student loans are approved on the basis of merit and need. The student's scholastic standing, credit record, and ability to repay the loan within the specified time are considered. Information on and applications for loan programs may be obtained from the Financial Aids and Scholarships Office (105 Student Services Building).

6.0 Thesis Advisor and Supervisory Committee

6.1 Research Topic and Thesis Advisor

If the graduate student has entered the program without an assigned thesis advisor, the Director of Graduate Studies may appoint a temporary thesis advisor. The graduate student should discuss possible research projects with all faculty members in the student's area of interest and select a topic and a thesis advisor. Graduate students are required to choose a research thesis topic before the end of their second semester of study.

6.2 List of Faculty and Their Teaching and Research Specialties

Information on research, adjunct, or other auxiliary faculty may be found on our website.

Darryl Butt, Ph.D. Professor	Materials for energy applications, novel methods of joining and coating materials, sensors for monitoring rad waste storage, aircraft engine performance, preservation science, materials synthesis and characterization
Krista Carlson, Ph.D. Assistant Professor	Melt and sol-gel derived glasses, development of high specific surface area membranes for pollutant capture, electrocatalytic materials for water disinfection and biofilm destruction.
Ravi Chandran, Ph.D. Professor	Mechanical behavior of materials, fatigue and fracture mechanics, functionally graded materials, composites, thermal barrier coatings, computational material science, synthesis and processing of materials
Zhigang Zak Fang, Ph.D. Professor	Powder metallurgy; composite, hard and superhard, and nanostructured materials; fracture and wear, sintering, ultrahigh-pressure consolidation, powder processing and forming, cellular metals
Michael L. Free, Ph.D. Professor	Hydrometallurgy, electrometallurgy, corrosion, materials synthesis, metal extraction and purification, and modeling.
Sivaraman Guruswamy, Ph.D. Professor, and Director of Graduate Studies & of Graduate Admissions for Metallurgical Engineering	Physical metallurgy; powder metallurgy; plasmonic and magnetic materials development, processing, and characterization; solidification processing; bulk single-crystal growth; and thin film processing and characterization.

<p>Jan D. Miller, Ph.D. Ivor Thomas Distinguished Professor of Metallurgy</p>	<p>Mineral processing, liberation, particle technology, flotation chemistry, hydrometallurgy, 3D characterization, analysis, and simulation of multiphase systems using x-ray microtomography.</p>
<p>Swomitra Mohanty, Ph.D. Assistant Professor</p>	<p>Renewable and alternate energy, biofuels, nanotechnology for electronic sensing of chemical and biomarkers.</p>
<p>Raj K. Rajamani, Ph.D. Professor</p>	<p>Computer control of grinding, flotation and hydrometallurgical systems, mathematical modeling of mineral processing and chemical metallurgical systems</p>
<p>Michael Simpson, Ph.D. Professor and Chair</p>	<p>Pyrometallurgy of nuclear materials, molten salt electrochemistry, zeolite applications, nuclear safeguards.</p>
<p>York Smith, Ph.D. Assistant Professor</p>	<p>Photoelectrochemical reactors, recycling, and material chemistry.</p>
<p>Hong Yong Sohn, Ph.D. Distinguished Professor</p>	<p>Chemical synthesis of advanced materials, metallurgical processing engineering including CFD Modeling, fluid-solid reactions, flash Ironmaking, solvent extraction.</p>

6.3 Supervisory Committee

The Supervisory Committee consults with the student in planning her/his degree program and thesis or dissertation research. The Committee is responsible for approval of the student's Program of Study; research proposal; thesis, dissertation, or final research report; and Final Oral Examination. If a Supervisory Committee finds a graduate student's preliminary work deficient, the student may be required to take supplementary undergraduate courses, for which graduate credit will not be allowed.

The faculty member who directs the thesis or dissertation work (the thesis advisor) usually serves as the Committee Chair of the Supervisory Committee.

Appointments to Graduate Supervisory Committees of persons who do not have a regular, research, lecture, adjunct, clinical, or other instructional appointment in the university, must be approved by action of the Graduate Council on the recommendation of the Supervisory Committee Chair and (for M.S. or Ph.D.) the Dean of the Graduate School.

Once Supervisory Committee members have agreed to serve, the student requests the departmental Graduate Student Advisor, in writing, to prepare the form "Request for Supervisory Committee." Provide the names of the prospective committee members and their affiliations. See deadlines, below.

6.3.1 Master of Science

By the end of the second semester of a student's graduate work, the student, in consultation with his/her thesis advisor, forms a Supervisory Committee, which is approved by the Department. The Committee normally consists of three faculty members, including one faculty member from outside the major field. At least two members must be tenured or tenure-track faculty in the Department. Exceptions must be approved by the Director of Graduate Studies and by the Graduate School.

6.3.2 Doctor of Philosophy (Ph.D.)

Following passage of the Qualifying Examination, the student, in consultation with his/her thesis advisor, forms a Supervisory Committee, which is approved by the Supervisory Committee Chair. The Committee normally consists of five faculty members, including three tenure-track faculty members in the Department, one University of Utah faculty member from outside the Department, and one other faculty member or researcher either from within or outside the Department. Four of the five members must be tenured or tenure-track. An exception may be made when in the opinion of the Supervisory Committee Chair and the Director of Graduate Studies the work of the Committee will be strengthened by a departure from this rule.

6.3.3 Master of Engineering

By the end of the second semester of a student's graduate work, the student, in consultation with his/her thesis advisor, forms a Supervisory Committee, which is approved by the Department. The Committee normally consists of three faculty members, including one member from outside the major field. Two of the three members must be tenured or tenure-track faculty.

7.0 Degree Requirements: Coursework

The university confers graduate degrees upon candidates who meet the requirements designated by the appropriate graduate committees, the Graduate Council, and the faculty of the university. Credit toward a graduate degree is recognized only for those courses for which the student is registered or those credits that are transferred with the Department's approval.

7.1 Requirements for All Degrees

7.1.1 Prerequisites

As a prerequisite to acceptance in the graduate program, students normally have completed all courses required for the award of the degree of B.S. in Metallurgical Engineering as detailed in *The University of Utah General Catalog*, or equivalent courses at other universities.

In cases where the student has not completed these courses, s/he includes in her/his course of study for a higher degree those courses required to satisfy the requirement. Exceptions must be approved by the Supervisory Committee. Courses completed for undergraduate credit do not normally qualify for graduate credit.

In order to plan your coursework, ask the departmental Graduate Student Advisor how many semesters of tuition benefit you may be eligible for. If you have received a Master's degree, consult with your thesis advisor and the departmental Director of Graduate Studies whether any Master's courses may be used to waive required Ph.D. coursework.

7.1.2 Graduate-Level Courses

All courses numbered 6000 or above are considered graduate-level courses. No 5000-level or lower courses are accepted for graduate credit without the prior written approval of the student's Supervisory Committee and the Director of Graduate Studies.

See *The University of Utah General Catalog* for a list of graduate courses.

7.1.3 Core Courses for M.S. and Ph.D. Programs

A series of core courses have been established for the graduate program. These courses are highly recommended and are considered basic for each discipline. See the departmental Graduate Student Advisor for more information.

Core Courses for Graduate Students for Different Focus Areas

Mineral Processing

MET E 6670 Mineral Processing I
MET E 6750 Rate Processes

Hydrometallurgy

MET E 6670 Mineral Processing I
MET E 6700 Hydrometallurgy MET E 6750 Rate Processes

Pyrometallurgy

MET E 6750 Transport and Rate Phenomena
MET E 6710 High-Temperature Chemical Processing

Physical Metallurgy

MET E 6260 Physical Metallurgy I MET E 6450 Mechanical Metallurgy
MET E 6780 Metals Processing

Additional Core Courses for Ph.D. Students

Mineral Processing

MET E 6730 Flotation Chemistry
MET E 6680 Mineral Processing II

Hydrometallurgy

MET E 6600 Corrosion Fundamentals and Minimization
MET E 6710 High-Temperature Chemical Processing

Pyrometallurgy

MET E 6700 Low Temperature Chemical Processing
CHEM E 6553 Chemical Reaction Engineering
MET E 6750 Transport and Rate Phenomena

Physical Metallurgy

MET E 6300 Alloy and Material Design
MET E 7270 Physical Metallurgy II
MET E 6240 Principles and Practice of Transmission Electron
Microscopy
MET E 6250 X-ray Diffraction

7.1.4 Course Fees

All students registered for laboratory courses in the department are assessed a fee to offset the cost of replacing reagents, glassware and other expendable materials used or damaged during the semester. Course fees may also be assessed for courses with field trips.

7.1.5 Graduate Seminar Attendance

All graduate students are required to attend *Graduate Seminar* (MET E 7800) every semester that they are at the university. Registration for *Graduate*

Seminar is required Fall and Spring semesters each academic year, for two years for an M.S. degree and for three years for a Ph.D. degree. No more than two credits (four half credits) for graduate seminar may be applied towards an M.S. degree. No more than three credits (six half credits) may be applied towards a Ph.D. degree.

If the student completes all work on the degree in less than two years for an M.S. or three for a Ph.D., the requirement is 75% attendance during this shorter time.

As proof of attendance, the student signs the roll at each seminar. If a student attends at least 75% of seminars during each semester, s/he receives credit for the course.

If you will be unable to attend due to conflicts with other courses, employment, etc., discuss this with the departmental Graduate Student Advisor beforehand. Extra credit may be available for conference attendance.

Each student is required to present a seminar at least once. See section 8.1.6.

7.1.6 Maximum Registration

No candidate for a graduate degree may register for more than sixteen credit hours in any one semester. This includes evening resident credit and daytime classes. Teaching fellows and others employed approximately halftime are limited to a maximum registration of twelve credit hours.

7.1.7 Transfer Credit

Graduate credit may be transferred from other institutions and applied toward fulfillment of graduate degree requirements.

Up to six hours of transfer credit from graduate-level courses may be applied toward fulfillment of master's degree requirements. For PhD students, up to 12 hours of transfer credits from courses may be applied towards fulfillment of PhD degree course requirements. Course credits used for a Master's degree may be used to fulfill the course credit requirement for the Ph.D. degree. Transfer credit must be

- a) of high grade (B- or higher), and
- b) recommended by the student's Supervisory Committee with approval by the Director of Graduate Studies.,

7.1.8 Nonmatriculated or Correspondence Work

A student may count no more than six credit hours of nonmatriculated work toward a graduate degree, unless the student's registration for additional credit is

specifically approved in advance by the Supervisory Committee Chair. Courses taken by correspondence or home study are not eligible for graduate credit.

7.2 Master of Science

7.2.1 General Coursework and Study Requirements for the M.S.

Candidates for the Master of Science degree must earn a minimum of thirty semester hours in graduate courses and thesis research. A minimum of twenty semester hours must be in coursework in Metallurgical Engineering or related technical subjects, with the balance (ten semester hours) in thesis research. The student is required to maintain at least a 3.0 grade point average. Faculty Consultation (MET E 6980) does not count toward fulfillment of degree requirements.

7.2.2 Residency

At least twenty-four credit hours must be in resident study at the university.

7.2.3 Independent Study

Time spent on research preparation, bibliographic work, acquiring new mathematical or computer skills, or developing new instrumentation are to be counted toward fulfilling an *Independent Study* (MET E 7920) class requirement. An M.S. student may register for up to three *Independent Study* hours per semester and may take up to six credit hours of *Independent Study* classes total. The instructor will typically be the student's research supervisor but may in special cases be another faculty member. A student needs approval from her/his thesis advisor or an individual instructor before registering for *Independent Study*. Each faculty member's *Independent Study* class is identified by a section number in the course catalog.

7.2.4 Program of Study

Once the student has completed his/her coursework, but at least one semester before graduation, the student obtains approval of her/his coursework from the committee. The student provides the necessary information, in writing, on approved coursework to the departmental Graduate Student Advisor to prepare the online "Program of Study" form. The Program of Study must also be approved by the Dean of the Graduate School. Subsequent changes must be approved by the student's Committee and a new Program of Study submitted.

7.2.5 Time Limits

All work offered for the Master's Degree must be completed within four consecutive calendar years from matriculation. This includes transfer credits. The department may modify or waive this requirement in meritorious cases on recommendation from the student's Supervisory Committee.

7.3 Doctor of Philosophy (Ph.D.)

The Ph.D. degree represents the highest scholarly achievement demonstrated by independent research and is not awarded simply for the fulfillment of resident or credit requirements.

7.3.1 General Coursework and Study Requirements for the Ph.D.

The student must do three or more years of approved graduate study, including one year (that is, two consecutive semesters) in full-time continuous residence at the University of Utah.

A minimum of sixty-seven semester hours of credit is required for the degree, of which thirty-three credit hours are course credits in Metallurgical Engineering or related technical fields (for example chemical engineering, materials science, nuclear engineering, chemistry, etc.), and thirty-four are dissertation research credits. Faculty Consultation (MET E 7980) does not count toward fulfillment of degree requirements.

Courses taken for a master's degree may be used to waive parts of the total credit hours required for the doctoral degree.

The student is strongly encouraged to take the Ph.D. core courses. Also, a student is encouraged to take core courses from areas other than her/his own main area. For instance, mineral processing students may take physical metallurgy and extractive metallurgy classes and vice versa.

7.3.2 Independent Study

Time spent on research preparation, bibliographic work, acquiring new mathematical or computer skills, or developing new instrumentation can be used as the basis for completing *Independent Study* (MET E 7920) class. A Ph.D. student may register for up to a limit of five credit hours of *Independent Study* per semester and may take up to sixteen hours total. The instructor will typically be the student's thesis advisor but may in special cases be another faculty member. A student needs approval from her/his thesis advisor or an individual instructor before registering for *Independent Study*. Each faculty member's *Independent Study* is identified by a section number in the course catalog.

7.3.3 Residency

At least one year (that is, two consecutive semesters) of the doctoral program must be in full-time academic work at the university. For the purpose of fulfilling the residency requirement, a full load is nine hours. When a student proceeds directly from a master's degree to a Ph.D. degree with no break in the Program of Study (except for authorized leaves of absence), the residency requirement may be fulfilled at any time during the course of study.

7.3.4 Admission to Candidacy for the Ph.D. Program – Qualifying Examination

All students desiring to study for the Ph.D. degree must take a Qualifying Examination in the field of Metallurgical Engineering. The Qualifying Examination is based on undergraduate work and is an oral exam followed if necessary by a written exam. Upon passage, the departmental Graduate Student Advisor enters the date of the examination in the student's online record. If the examining committee deems it necessary, the committee may also require the candidate to take and pass courses in certain areas.

The Qualifying Examination is given in April of each year. Students with a prior degree in Metallurgical Engineering who start the Ph.D. program in Summer Term or Fall Semester should take the Qualifying Examination the following April. Students arriving Spring Semester take the Qualifying Examination in April of the following year. A student without a lower degree in Metallurgical Engineering who desires to obtain a Ph.D. in this discipline may take the exam the second April s/he is on campus, as s/he has to take undergraduate courses to achieve competency in this field.

A departmental Qualifying Examination Committee considers the student's scholastic record (GPA, master's thesis, performance in coursework after the master's degree, etc.), together with performance in the exam, in order to reach a decision on whether or not to admit him/her to candidacy for the Ph.D. degree.

Students are not normally allowed to take the Qualifying Examination a second time. If a student is not granted admission to the Ph.D. program and s/he feels that the decision should be reconsidered, s/he may submit a written petition to the faculty containing all pertinent information which could affect the decision. The quality of the petition is reviewed by the faculty, and a final decision rendered.

The student must pass the Research Proposal Examination within twelve months after the Qualifying Examination.

7.3.5 Program of Study

It is suggested that the student find a thesis advisor as soon as possible, because the burden of convincing the Supervisory Committee of the course hours falls upon the student otherwise. Each semester the student must get the thesis advisor's approval of the classes for which s/he is planning to register. Finally, the Supervisory Committee must also approve the student's coursework.

The student provides the necessary information, in writing, to the departmental Graduate Student Advisor to enter the Program of Study in the online record. Subsequent changes must be approved by the Supervisory Committee and a new Program of Study submitted.

7.3.6 Time Limits

All work offered for the Ph.D. Degree must be completed within seven consecutive calendar years from matriculation. The department may modify or waive this requirement in meritorious cases on recommendation from the student's Supervisory Committee.

7.4 Master of Engineering (M.E.)

This degree is not based solely on the accumulation of a given number of hours of course work but should be built around providing specialized training for the student. All requirements for the M.S. degree with the exception of the thesis apply to the M.E. degree. In place of a thesis defense the candidate must take a comprehensive oral and/or written examination conducted by his/her Supervisory Committee.

7.4.1 Admission to Candidacy

The qualifications for admission to the Master of Engineering Program are the same as those of the Graduate School.

Once the student has completed his/her coursework, but at least one semester before graduation, the student obtains approval from the committee of her/his coursework. The student requests the departmental Graduate Student Advisor to enter the Program of Study in the online record and provides the necessary information, in writing, on coursework. Subsequent changes must be approved by the student's Committee and a new Program of Study submitted.

7.4.2 Course Requirements

Information of the specific requirements for the degree may be obtained from the department or *The University of Utah General Catalog*.

The Master of Engineering degree requires completion of a minimum of thirty credit hours of graduate, professionally oriented course work. These hours may include both graduate courses and approved undergraduate courses. Twenty credit hours are in the major area and include special topics courses of four to six credit hours. Special topics are individual work in some aspect of engineering design and must result in a final report.

Thesis research hours do not apply towards the total hours required. Thus, the actual coursework requirements are greater than for an M.S. Be aware of this particularly if changing status from an M.S. to an M.E.

The Program of Study for each Master of Engineering degree candidate is carefully planned by the student and her/his Supervisory Committee of three faculty members, who may request the assistance of additional faculty members.

7.4.4 Time Limits

All work offered for the Master of Engineering Degree must be completed within four consecutive calendar years unless an extension is granted by the dean of the college.

7.4.5 Final Report and Examination

In place of the Master's Thesis the student must write a paper involving an aspect of engineering design which represents an equivalent effort of four to six semester credit hours. The paper may include process design, field studies or other appropriate topics. The candidate must take a comprehensive oral and/or written examination conducted by his/her Supervisory Committee.

The candidate must be regularly enrolled for three or more credit hours at the university during the semester or term in which the final report is submitted and the examination conducted.

8.0 Degree Requirements: Research

8.1 Requirements for All Degrees

8.1.1 Research Topic and Thesis Advisor

If the student is not assigned to a particular thesis advisor upon starting the program, the graduate student should discuss possible research projects with all faculty members in the student's area of graduate studies and select a topic and a thesis advisor. Graduate students are required to choose a research thesis topic before the end of their second semester of study.

Every person who works in the departmental laboratories must be either a registered student, an employee of the University, or an appointed visiting researcher or scholar.

8.1.2 Laboratory Safety and Work-Related Injuries

Anyone working in a university laboratory must take Chemical Hygiene Training annually.

**Any injury occurring on campus must be reported
to the department office within twenty- four hours.**

The preferred provider for work-related injuries is

Monday through Friday 8:00 a.m. to 5:00 p.m.

OccMed Clinic at Redwood Health Center
1525 West 2100
South Salt Lake
City UT 84119
(801) 213-9777

After hours:

Urgent Care at the Redwood Health Center (801) 213-9700
or University of Utah Emergency (801) 581-2291

8.1.3 Laboratory Notebook

All research should be recorded in a laboratory notebook, issued by the Department. Proper laboratory notebook usage should be followed under the guidance of the faculty thesis advisor.

8.1.4 Semester Research Report

All graduate students who are registered for *Thesis Research – Masters* (MET E 6970) or for *Thesis Research – Ph.D.* (MET E 7970) must write a semester research report. The report must be typed, complete and concise, and submitted by email to the Department office and to the thesis supervisor by the last day of classes. No research grade is given without a report.

8.1.5 Research Equipment

Some research equipment is used in common by all graduate students. A student must be trained and qualified in the use of a piece of equipment before using it. When using equipment, the use-time must be logged in.

If equipment is moved, the student is responsible to notify the department of its new location. The department must account for all equipment once a year.

For use of equipment under a research group, permission from the faculty in charge of the group is needed. For equipment under recharge centers, a project or activity number must be provided. If no project or activity to which it can be charged is available, special permission for use must be obtained from the faculty in charge of the recharge center or from the Department Chair

8.1.6 Graduate Seminar Presentation

Each graduate student must present at least one graduate seminar during her/his graduate residency. The student is expected to present his/her work in a clear and concise manner, although the research may still be in progress. Presentations should follow good technical procedures and include objective, background, experimental results, and discussion. Equipment is available to supplement the talk with appropriate visual aids. Visual aids should be simple, avoiding too much information on one screen.

The student is evaluated by the faculty and by other students on her/his presentation. Each year an outstanding presentation award is made for the best graduate student speaker as determined by peer evaluation.

8.2 Laboratory and Building Access

Upon entering the department, a student is entitled to a key or card entry to her/his laboratory space and to a key or card entry to the building entrance. Keys to other laboratory space may be obtained as the student's research necessitates.

The student is required to pay a deposit and fill out a "Request for Keys" for each key requested. The key application must be signed by the student, initialed by her/his faculty thesis advisor or Principal Investigator, and receive authorizing signatures by the Department and Dean's Office.

Lending keys is grounds for termination from the university.

Prior to leaving the university, keys must be returned to the department office. The deposit is refunded when the keys are returned. A hold may be placed if the keys are not returned.

8.3 Research Proposal Requirements

The student outlines the course of research to be pursued in collaboration with his/her thesis advisor. The proposed research plan is then presented to the Supervisory Committee for approval. In the proposal, the student should clearly state his/her research objectives and plan of attack and what s/he hopes to accomplish.

8.3.1 Additional Research Proposal Requirements for Ph.D.

The Research Proposal Examination is given by the student's Ph.D. Supervisory Committee. The examination consists of an oral defense of a written research proposal on a subject either on or not on the student's research topic, at the discretion of the Committee. The examination should occur within six to twelve months of passing the Qualifying Exam.

The research proposal should be organized as follows:

1. Abstract
2. Introduction
3. Literature Survey
4. Proposed Research Program
5. Conclusions
6. Nomenclature
7. References

The proposal should be between fifteen and twenty double-spaced typed pages of text plus tables, figures, and appendices.

The proposal should be submitted to the Committee at least two weeks in advance of the oral presentation to the Committee. The student then defends the proposal and answers all questions of the Committee.

The Committee determines whether 1) the student is passed, 2) after proper revision of the proposal as directed by the Committee, if successful, the student is passed, or 3) the proposal and defense are inadequate and the student should repeat the entire process with a new research proposal. A maximum of two attempts is permitted.

9.0 Thesis or Dissertation and Final Examination

Master of Engineering students must write a Final Report rather than a thesis or dissertation. See section 6.4.5.

9.1 Both Master of Science and Doctor of Philosophy

9.1.1 Submission of Thesis or Dissertation

Upon completion of his/her research, the student submits a typed draft of the thesis or dissertation to her/his Supervisory Committee Chair and final versions to his/her Supervisory Committee.

9.1.2 Thesis or Dissertation Formatting

Formatting instructions are given in *Handbook for Theses and Dissertations*, available from the Thesis Office, either online or for a small deposit for a printed copy. The primary style guide for theses produced in our department is *Handbook for Authors from American Chemical Society Publications*, American Chemical Society. Alternative standards are suggested in the *Handbook for Theses and Dissertations*.

9.1.3 Final Oral Examination (Thesis or Dissertation Defense)

Upon acceptance of his/her thesis or dissertation by the Supervisory Committee Chair, the student is required to orally defend his/her thesis or dissertation before the Supervisory Committee.

The candidate must be regularly enrolled at the university for three or more credit hours or for three credit hours of *Faculty Consultation* (MET E 6980 or 7980) during the semester or term in which the Final Oral Examination is taken.

The Final Oral Examination is given by the candidate's Supervisory Committee. The Committee Chair normally chairs the examination.

The student submits a draft of his/her thesis or dissertation to the Committee Chair at least three weeks before the Final Oral Examination and a typed copy to the Supervisory Committee at least two weeks before the examination.

Once the Final Oral Examination is scheduled, the student provides the departmental Graduate Student Advisor with information on the date, time, and place of the examination, and the title of her/his presentation (usually the thesis title). This should be done at least a week before the examination.

The student prepares the form "Report of the Final Oral Examination", to be signed by the Supervisory Committee at or after the examination, indicating whether the student has passed the Final Oral Examination. The student submits

the signed Report to the departmental Graduate Student Advisor, Sara Wilson, who enters the date of the Final Oral Examination in the student's online record.

The examination must be passed at least six weeks before graduation. For deadlines in a particular semester, see the Graduate School Thesis Office calendar.

9.1.4 Thesis Correction, Approval, and Release

Following the defense, the student makes corrections in the thesis or dissertation as required by her/his Committee Chair and Committee.

Due to changes in policy, if an international student does not receive thesis clearance the same semester as the Final Oral Examination, s/he can no longer request a correction semester and needs to have obtained Optional Practical Training authorization to be effective right after the semester when he/she completed the Final Oral Examination. As immigration policies are frequently changing, please consult the International Student and Scholar Services office well in advance of your graduation to ensure that you are always in status.

After the Committee Chair signs the "Final Reading Approval," the student submits a printed copy of the thesis or dissertation to the Thesis Editor. The student makes corrections required by the Thesis Editor.

Following approval by the Thesis Editor, the student provides an electronic copy (pdf) of the thesis or dissertation to the Thesis Editor and to the department.

The student may submit one or more unbound printed copies of the approved thesis or dissertation with a fee for bookbinding to the Campus Store if the student wishes for a bound copy for him/herself or if the thesis advisor desires a printed bound copy.

9.2 Ph.D. Dissertation Requirements

The dissertation must embody the result of independent research and constitute a contribution of knowledge in the student's field. The intellectual and creative matter presented in the dissertation must meet the standards of the particular college, department, and the student's Supervisory Committee. The dissertation may take the form of a manuscript or manuscripts to be submitted for publication in a scholarly journal, with the graduate student as senior author. See *The University of Utah General Catalog* for further details.

10.0 Graduation

10.1 Graduation Application

All graduate students are required to complete a graduation application and submit it to the Office of the Registrar, Graduation Division the semester before they plan to graduate. See the Registrar's website for more details.

Check with the departmental Graduate Student Advisor that all necessary information has been entered in the online record. This includes Supervisory Committee, Qualifying Examination (if applicable), Program of Study, and Final Oral Examination.

10.2 Thesis Release

A student's semester of graduation is the semester in which the "Thesis Release" (Graduation Release) is signed, not necessarily the semester in which the student passes the Final Oral Examination. To graduate during a particular semester, the Thesis Release must be submitted to the Graduate Records Office before the Registrar's closing date for the semester (the last day of finals). See the Thesis Office website for details.

10.3 Graduation Ceremonies

The university holds graduation ceremonies once a year, after Finals during Spring Semester. Commencement is for all graduating student in the university. Each college holds a Convocation for its own students. Students who graduated the previous Summer term or Fall Semester, or who expect to graduate that Spring or Summer, are encouraged to participate. Students may also participate early if, for instance, they expect to finish Fall or the following Spring but anticipate they will have left the university before the end of Spring semester, or for other reasons. See the department office for more details..

10.4 Leaving the Graduate Program

When graduating or leaving the graduate program, prior to departure the student must

1. Check in equipment and supply items, including computers.
3. Give laboratory notebooks and other research products/samples to the thesis advisor.
3. Properly dispose of any remaining chemicals and samples.
4. Return all borrowed books to their owners (e.g., your advisor, or university libraries).
5. Return all keys to the department office and get your deposit.
6. Provide to the department a forwarding address, a photograph, a short biographical statement, and information on current employment.

11.0 Policies on Termination of a Graduate Student/Thesis Advisor Relationship and Dismissal from the Program

The following policies have been approved, effective Fall 2018, by the Faculty of the Department of Materials Science & Engineering when it becomes necessary to terminate a research relationship between a graduate student and his/her thesis advisor or to dismiss a graduate student from the program. Either the graduate student or the thesis advisor may terminate a student/thesis advisor relationship.

11.1 Termination of a Graduate Student/Thesis Advisor Relationship

When a faculty thesis advisor is dissatisfied with the research effort of a student, the thesis advisor should communicate to the student the concerns he/she has regarding research quality, productivity or professional conduct not meeting expectations. If the deficiencies persist, the thesis advisor must communicate to the student in writing the unsatisfactory aspects of the student's research performance, inform the student that he/she is being placed on probation, and allow the student a reasonable time (at least 30 days) to correct the deficiencies. The letter should include recommendations for corrective actions and desired improvements, and should indicate a date by which improvement is expected. A copy of this letter should be sent to the Chair of the Department and Director of Graduate Studies. A copy of the letter will be placed in the student's file.

If the deficiencies still persist at the end of the probationary period, it is the prerogative of the thesis advisor to terminate the student/thesis advisor relationship. The following procedure is used:

- a) Notify the student in writing, giving reasons for the termination, indicating a formal termination date at least 15 days after the date of the letter (the "Termination Date"). A copy of the letter should be sent to the Chair of the Department and Director of Graduate studies. If the student is being paid as a Research Assistant, the student should be kept on the payroll for 15 days after the date of the notification letter to allow time to obtain a new thesis advisor, unless a new thesis advisor puts the student on a payroll before the end of the 15 days. As a matter of policy, the department does not provide stipend support beyond 15 days for students as they seek a new thesis lab. The student may lose tuition benefit if total stipend support received for the semester does not meet the current minimum as specified under the tuition benefit program.
- b) If a student cannot find a new thesis advisor by the Termination Date or if the student moves to a different department or position, he/she will be dismissed from the Metallurgical Engineering graduate program.

- c) If the student is being paid as a Teaching Assistant, the Department will continue the current T.A. support until the end of the termination semester, contingent on the T.A. duties being carried out conscientiously.

It is the student's obligation to turn over all data and notebooks arranged in a manner that will allow the thesis advisor to continue the work. If these materials are not turned over by the Termination Date, the student may be referred to the University's Dean of Students for disciplinary action. A hold will also be placed on the student's academic records pending return of the materials. The student is ultimately responsible for ensuring all Graduate School and departmental requirements are met and forms are submitted for the transition (refer to Graduate Student Manual). The final outcome of the process should be documented and placed in the student's file.

A student who wants to leave a research group should give the thesis advisor 30 days' written notice outlining the reasons for leaving the group. During the 30 days, the research task(s) should be brought to a point where it could be easily passed on to a new person. All notebooks, computer files, and data should be returned to the thesis advisor before the student is put on another faculty member's payroll. It is the student's responsibility to identify a new thesis advisor if the student wishes to continue in the Program. Failure to identify a new advisor by the end of the 30-day period may result in dismissal from the Program.

A student who changes to a new research group is obligated to submit written, signed, and dated notice to the Department and the Director of Graduate Studies, and should also reconstitute the student's supervisory committee. If the student has already presented a research proposal to the initial supervisory committee, the student must prepare a new research proposal outlining the new thesis project within five months of joining the new research group and present it to the new supervisory committee. Failure to obtain written approval from the supervisory committee within six months of switching advisors may result in dismissal from the Program. As discussed elsewhere in this graduate student handbook, regular review of student progress will be via a performance review with your thesis advisor at the beginning of each semester. A student progress report form will be required to be submitted to the director of graduate studies.

IMPORTANT: Students adding and/or dropping courses after the semester's published add/drop deadlines are responsible for any and all charges incurred, including withdrawals. Tuition benefit will not pay for withdrawn credit hours, and 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.

11.2 Policy on Dismissal from the Program

The following are situations where a student will be considered to not be in good academic standing and may be subject to dismissal from the program. Action on such dismissal will be decided by an ad hoc committee consisting of the department chair, director of graduate studies, and thesis advisor.

- Failure to pass all courses with a grade of B- or better. If a grade less than B- is earned, the student will be placed on probation for a semester. Earning another grade less than B- in the probationary semester is grounds for dismissal.
- GPA (either cumulatively or in a particular semester) of less than 3.0. If a student's GPA drops below 3.0, the student will be placed on probation and allowed one semester to raise his or her GPA to at least 3.0.
- Unsatisfactory completion of laboratory rotation or research performance
- failure to pass the Ph.D. qualifying exam
- Failure to make timely progress toward completion of the doctoral degree as determined by the student's supervisory committee

If concerns arise due to behavioral misconduct, these issues are adjudicated through the Dean of Student's Office. In any such event, the procedures outlined in the "Code of Student Rights and Responsibilities" shall be followed (<http://regulations.utah.edu/academics/6-400.php>).

If a student is dismissed from the Ph.D. program based on a performance issue but has completed a body of work and completed coursework needed to satisfy the requirements for an M.S. degree, the student will be given the opportunity to defend his or her thesis and apply for graduation with an M.S. degree. The student may not necessarily receive stipend or tuition benefit during the period needed to write and defend the M.S. thesis.

Dismissal of a student from the program will be carried out in compliance with "Code of Student Rights and Responsibilities".

12.0 Student Advisory Committee (S.A.C.)

12.1 Membership

The Departmental Student Advisory Committee consists of two undergraduate and two graduate students from within the department, who are elected yearly at the end of the Spring semester. This body then meets to elect a Committee Chair and to appoint any additional members deemed necessary.

12.2 Purpose and Scope

The primary objective of the Department SAC is to promote purposeful communication between the student body and the faculty on a professional and technical as well as a social level. The following duties are illustrative of the ways in which this can be accomplished:

- (a) It is the aim of the SAC, with the assistance of the faculty, to promote a feeling of professionalism among the students and to prepare the students for what will be expected of them in their careers. Special emphasis is placed on those intangible items that are difficult to transmit in a classroom environment (e.g., the demands of an industrial environment as opposed to an academic one: job availability and interviewing).
- (b) Department SAC chair or its selected/elected representative serves as a member of the College Student Council.
- (c) As required by university policy the SAC provides -input on any faculty member being considered for retention, tenure or promotion.
- (d) The SAC assists in selecting the faculty member to receive the Mellow Met Award for Excellence in Teaching Metallurgical Engineering and the teaching assistant to receive the department award for best teaching assistant.
- (e) In cases of disputes involving students and faculty the SAC acts as intermediary. In addition the SAC is prepared to offer information and counseling to any student involved.

13.0 Timeline of Objectives for Graduate Degrees

To stay on schedule, the graduate student should complete the objectives within the time given. See the page(s) referenced for additional information. The student is expected to provide necessary information for the department to prepare the required online forms. For specific deadline dates in any semester, see the calendars for the graduate program and the thesis office on the Graduate School website (URLs are given in the Appendix).

Unless otherwise specified, requirements apply to both M.S. and Ph.D.

13.1 First Year

Familiarize yourself with the requirements in the *Graduate Catalog: Policies and procedures for graduate students* (see the Graduate School website) and in the department's *Graduate Student Handbook*.

In order to plan your coursework, ask the departmental Graduate Student Advisor how many semesters of tuition benefit you may be eligible for.

Take Chemical Hygiene Safety Training every year. See p. 20.

Each semester, register for and attend at least 75% of graduate seminars. Credit is based on attendance. See p. 13.

M.S. Register for seminar each Fall and Spring semester for two years.

Ph.D. Register for seminar each Fall and Spring semester for three years.

If a thesis advisor was not selected during admission, select one during the first or second semester. Select a research topic. See pgs. 9 and 20.

Ph.D. If you have received a Master's degree, consult with your thesis advisor and the department Director of Graduate Studies whether any M.S. courses may be used to waive required Ph.D. coursework.

M.S. During the second semester, form a Supervisory Committee. Request the departmental Graduate Student Advisor, in writing, to enter the Supervisory Committee in the online record. See p. 10.

Ph.D. Take the Ph.D. Qualifying Examination the first April after admission. See p. 16.

13.2 Second Year

Domestic students apply for residency.

Take Chemical Hygiene Safety Training each year.

Each semester, register for and attend at least 75% of graduate seminars. Credit is based on attendance.

Ph.D. Form a Supervisory Committee after the qualifying exam, during the second year of graduate work. Request the departmental Graduate Student Advisor, in writing, to enter the Supervisory Committee in the online record. See p. 10.

M.S. Present the research proposal after completion of 75% of graduate course work. Give a printed copy to the supervisory committee two weeks before the oral presentation. See p. 21.

Ph.D. Present the research proposal within 12 months after the Qualifying Exam & before the end of the second year. Give a printed copy to the supervisory committee two weeks before the oral presentation. See p. 22.

M.S. Present a graduate seminar. See p. 21.

M.S. Finish at least twenty credit hours of course work and ten hours of MET E 6970 *Thesis Research* before tuition benefit support ends, within two years or four semesters and under 84 hours. See p. 6.

13.3 Third Year and Beyond (Ph.D.)

Ph.D. Take Chemical Hygiene Safety Training once a year.

Ph.D. Each semester, register for and attend at least 75% of graduate seminars. Credit is based on attendance.

Ph.D. Present a graduate seminar. See p. 21.

Ph.D. Finish at least 33 hours of course work and 34 hours of MET E 7970 *Thesis Research*, in less than 84 credit hours, before tuition benefit support ends. See p. 6.

13.4 Semester before Graduation

M.S. This will probably be the third semester of graduate studies (that is, during the second year).

Ph.D. This will probably be the fifth semester of graduate studies (that is, during the third year).

Familiarize yourself with *A Handbook for Theses and Dissertations*, available on the Thesis Office website. Use it while drafting your thesis. Check the Thesis Office Calendar for deadlines.

File a graduation application with the Office of the Registrar, Graduation Division. See p. 25.

After completion of all graduate coursework, provide a worksheet to the departmental Graduate Student Advisor showing which courses you have selected to be used for the "Program of Study". Submit official transcripts of transfer credits to the department and the Admissions Office for graduate work completed elsewhere. See pgs. 15, and 17.

13.5 Semester of Defense (Final Oral Examination)

Register for at least three credit hours. See pp. 3 and 23.

To graduate during the same semester, schedule the Final Oral Examination during the first few weeks of the semester.

Submit a draft of the thesis or dissertation to the Committee Chair at least three weeks before the Final Oral Examination, and to the Supervisory Committee at least two weeks before. See. p. 23.

Before the defense, prepare the forms “Report of the Final Oral Examination” and “Supervisory Committee Approval”. Get them signed during the defense.

The last possible day to defend the thesis or dissertation during a given semester, is the last day before the next semester starts.

13.6 After Defense and/or during the Semester of Graduation

Make changes in the thesis or dissertation required by the Supervisory Committee. Get the “Final Reading Approval” signed by thesis advisor.

Check with the departmental Graduate Student Advisor that all required forms and documentation has been submitted.

Submit one copy of the defended, committee-approved thesis or dissertation manuscript, plus the Final Reading Approval, to the Thesis Editor for proofreading and approval, six to eight weeks before the last day of finals of the semester of graduation, according to the deadline in the Thesis Office Calendar. See. p. 24.

Make changes in thesis or dissertation required by the Thesis Editor.

Once the Thesis Editor is satisfied with the corrections, submit an electronic (pdf) copy of the thesis or dissertation to the Thesis Editor, at least ten working days before the last day of finals.

M.S. Graduate within four years of entering the program.

Ph.D. Graduate within seven years of entering the program. See p. 15.

Before leaving the university, properly dispose of chemicals and samples, give laboratory notebooks and other research products/samples to the thesis advisor, return keys and library books, and provide a forwarding address, a short biographical statement, and a recent photograph of yourself to the department office. See p. 25.

14.0 Glossary

Definitions of various terms used in this manual appear in the text when first used and are also provided below. Pages referenced in the subject index provide more details.

<i>Term</i>	<i>Definition</i>
Associated Students of the University of Utah	A union of all students attending the University of Utah.
ASUU	An acronym for Associated Students of the University of Utah
continuous registration	A student must register for every fall and spring semester until s/he completes all requirements for her/his degree.
defense	Defense of thesis or dissertation, also known as the Final Oral Examination.
differential tuition	An additional tuition charge for courses offered through the College of Engineering and some other organizations; not covered by the Tuition Benefit Program.
Director of Graduate Studies	A faculty member in the department whose approval is required (in addition to that of the thesis advisor or Supervisory Committee) for various things.
Thesis advisor	A faculty member who advises the student on coursework specific to the student's Program of Study and supervises the student's thesis research.
Faculty Consultation	Course MET E 6980 or 7980, to be registered for during any semester when a student is off-campus and does not enroll in regular courses, seminars, independent study, or thesis research, and yet requires consultation with the faculty, or otherwise uses University facilities.
Final Oral Examination	The student defends her/his thesis or dissertation research work before the Supervisory Committee.
Final Reading Approval	A form signed by the student's thesis advisor, indicating that all corrections requested by the thesis advisor or the Supervisory Committee have been made.
departmental Graduate Student Advisor	A staff member in the department who advises all graduate students in the department on general program requirements; usually not the student's thesis advisor.
graduate-level course	A course that is numbered 6000 or above.

<i>Term</i>	<i>Definition</i>
graduation release	Approval by the Thesis Editor that the thesis or dissertation meets all university requirements, a.k.a. thesis release.
independent study	The course MET E 7920 <i>Independent Study</i> , consisting of time spent on research preparation, bibliographic work, acquiring new mathematical or computer skills, or developing new instrumentation.
International Student Fee	A fee charged, on top of tuition, to international students.
International Students and Scholars Service (ISS)	University department that ensures that the University of Utah complies with immigration regulations pertaining to international students and scholars; experts in the immigration regulations pertaining to non-immigrant F and J visa holders.
ISS	An acronym for International Students and Scholars Service.
leave of absence	A student may apply to not enroll in a particular semester, without dropping out of the graduate program.
Ph.D. Qualifying Examination	An examination, usually oral, covering undergraduate-level subjects in Metallurgical Engineering, which a student must pass, usually in the first year of study, in order to be accepted as a candidate for the Ph.D. degree.
Request for Supervisory Committee	A form setting up the student's Supervisory Committee.
SAC	An acronym for Student Advisory Committee.
seminar	The course MET E 7800 <i>Graduate Seminar</i> .
Student Advisory Committee (SAC)	Student group in the department, responsible for acting as liaison between students and the department; advising on faculty hiring, retention, tenure, and promotion; and organizing student events.
supervisory committee	Consults with the student in planning her/his degree program and thesis or dissertation research and approves the student's Program of Study; research proposal; thesis, dissertation, or final research report; and Final Oral Examination.
supervisory committee chair	The faculty member who directs the thesis or dissertation work (the thesis advisor) and usually serves as the Committee Chair of the Supervisory Committee.

<i>Term</i>	<i>Definition</i>
Supervisory Committee Approval	A form signed by the student's Supervisory Committee at or after the Final Oral Examination, saying the thesis is satisfactory.
Thesis Editor	A person in the Thesis Office of the Graduate School who edits theses and dissertations for grammar, spelling, and formatting.
Thesis Office	A division of the Graduate School which supervises approval of theses and dissertations.
Tuition Benefit Program	Research assistants, teaching assistants, and graduate fellows supported through the university at or above a minimum level have the resident tuition portion of tuition paid by the Graduate School, while the nonresident portion is waived. The TBP does not cover differential tuition, the International Student Fee, or other nonmandatory fees.
undergraduate-level course	A course numbered 1000 through 5999 and intended for undergraduate students.
Vacation semester	One semester each year in which an international students does not register, without losing visa status. International students are required to take a vacation semester each summer

15.0 Useful Websites

Admissions

Admissions	https://admissions.utah.edu/
International Admissions	https://admissions.utah.edu/international/index.php

Academic

Department of Materials Science & Engineering	http://www.mse.utah.edu
Graduate School	http://www.utah.edu/graduate_school/
Graduation Division, Office of the Registrar	http://www.sa.utah.edu/regist/graduation/applying.htm
Thesis Office (including handbook and calendar)	http://www.gradschool.utah.edu/thesis/
The University of Utah General Catalog	https://www.utah.edu/students/catalog.php
Tuition Benefit Program	https://gradschool.utah.edu/tbp/
Code of Student Rights and Responsibilities	http://regulations.utah.edu/academics/6-400.php

Employment

Payroll time reporting	https://www.kronos.utah.edu/
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Safety & Wellness

Chemical Hygiene Training	https://education.research.utah.edu/class_details.jsp?offeringId=106
Workplace Injury	https://www.hr.utah.edu/absenceMgt/workerscomp.php
University of Utah Department of Public Safety (DPS)	dps.utah.edu
University Resources for campus safety	https://registrar.utah.edu/handbook/campussafety.php
Counseling Center,	https://counselingcenter.utah.edu
Wellness Center,	https://wellness.utah.edu
Women's Resource Center.	https://womenscenter.utah.edu