GRADUATE STUDENT HANDBOOK

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Table of Contents

Table of Contents *2*

I. Introduction *8*

II. Terms and Definitions *9*

III. Admission *12*

A. Requirements and Procedures **12**

B. Applicants with Degrees Outside Industrial or Systems Engineering **13**

C. Degree Program Selection **13**

IV. Advising and Program Planning *14*

A. Advisors **14**

B. Examining Committee **15**

1. M.S. Non-Thesis Examining Committee **15**

2. M.S. Thesis Examining Committee **15**

3. Ph.D. Examining Committee **15**

C. Graduate College **16**

D. Graduate Student Peer Mentoring Program and Engineering Career Services **16**

E. Minimum Registration Guidelines **17**

V. Degree Requirements *18*

A. General Information for All Students 18

1. Requirement in Ethics 18

2. English as Second Language Testing 19

3. ISE Graduate Seminar 19

4. Individual Investigations ..... Error! Bookmark not defined.

B. Master of Science Degree Without a Thesis 20

C. Undergraduate-to-Graduate (U2G) Program 20

D. M.S. Thesis Option 21

E. En Passant Option 22

F. Doctor of Philosophy Degree 22

G. Examinations 23

1. Ph.D. Qualifying Examination 23

2. Ph.D. Comprehensive Exam 24

3. Final Examination – M.S. Thesis and Ph.D. Candidates 25

4. M.S. Thesis and Ph.D. Dissertation 25

H. Department Graduation Checklist 26

I. Graduation Checklist 27

VI. Financial Assistance 28

A. General 28

B. Sources of Support 28
C. Eligibility 28
D. Duration of Eligibility 29
E. Assistantship Responsibilities 29
1. Research Assistantship Activities 29
2. Absences and Vacation 30
3. Assignment 30
4. Renewal and Termination 31
Renewals (Reappointments) 31
Termination during the Term of an Appointment 31
F. Tax Status 31
G. Collective Bargaining Agreement 31
H. Special Requirements 32
VII. Student Evaluation 33
A. General Overview 33
B. Individual Development Plan 33
C. Graduate Student Reviews and Regular Meetings 34
D. Requirements for Meeting Expectations 35
E. Normal Progress 36

1. M.S. Non-Thesis Program 36
2. M.S. Thesis Program 37
3. M.S. Thesis Program with 50% RA/TA or part-time 38
4. Undergraduate-to-Graduate (U2G) Degree Program 39
5. Ph.D. Program 40
6. Part Time Ph.D. Program 42
7. Academic Standing, Probation, and Dismissal 43

VIII. Additional Student Expectations 44

A. Appropriate Professional Conduct 44
B. Scholarly Record Keeping 44
1. Laboratory Notebooks 44
2. Electronic Research Notes 44
3. Computers 44
C. General Participation and Service Requirements 45
D. Academic Misconduct 45

IX. Additional Considerations Regarding Graduate Education 47

A. Additional Support Resources 47
B. Changing Advisors 47
C. Intellectual Property 48

1. Academic Freedom 48
2. Copyright 49
3. Intellectual Property and Patent Rights 49
D. Student Complaints Concerning Faculty Actions 50
X. Departmental Policies 51
A. Smoking Policy 51
B. Student Workspace 51
C. Keys and Departmental Security 51
D. Computing 52
E. Shops 52
F. Purchasing Supplies and Services 52
G. Library 53
H. Secretarial Assistance/Copy Machine/Laser Printer 53
I. Use of Teaching Equipment for Graduate Research 53
J. Safety and Hazardous Materials 54
XI. Emergency Procedures 55
XII. Appendices 56
A. Appendix A – Code of Ethics 56
B. Expected Degree Progress 57

ISE Courses Approved for Graduate Credit and Focus Areas **59**

I. Introduction

The Department of Industrial and Systems Engineering (ISE) administers five advanced degree programs for the University of Iowa Graduate College: a full-time doctoral program, a part-time doctoral program, a 5-year combined undergraduate plus master's program (the UG2 program), a non-thesis master's program, and a master's program with thesis. This document covers all five programs for students entering the program in the Fall of 2021; students who entered the program prior to the Fall of 2021 fall under the guidelines of the Fall 2019 handbook, University General Catalogue *or* they may choose to use the guidelines from this version of the handbook.

This handbook is intended to inform graduate students and faculty of the policies, regulations, and procedures of the graduate program in Industrial and Systems Engineering, College of Engineering and the Graduate College. It also provides guidance regarding the academic performance, research excellence and general standards of conduct expected of students pursuing a Master of Science or Doctor of Philosophy degree in this department. Since this handbook is concerned primarily with acquainting the reader with departmental regulations, the general regulations of the Graduate College are not repeated in this handbook. Major changes to procedures, policies, and even the "normal" guidelines must be approved by the faculty at a department meeting. These rules may change at any time. This flexibility ensures the department can quickly respond to changing conditions and needs. We inform students as soon and as appropriately as we can about such changes. If there are ambiguities found in this handbook, please reach out to the departmental executive officer or director of graduate studies in the ISE department.

The graduate program is administered by the Graduate College, whose rules are found in its Manual of Rules and Regulations. The Graduate College is in turn administered by the University of Iowa, whose rules are found in its Operations Manual. The Department of Industrial and Systems Engineering is primarily administered by the College of Engineering, whose rules are found in its Manual of Procedures. Graduate students are expected to independently familiarize themselves with all Graduate College regulations and should be aware of the superseding authority of the College and University. If any of the policies, regulations, or procedures described here conflict with those of the University, the Graduate College, or the College of Engineering, then the rules of the superseding organization take precedence.

The University of Iowa values diversity among students, faculty, and staff, and regards Equal Employment Opportunity and Affirmative Action as tools to achieve diversity. The University believes that a rich diversity of people and the many points of view they bring serve to enhance the quality of the educational experience at The University of Iowa. (From the University of Iowa Operations Manual, Section 8.2.)

II. Terms and Definitions

Academic Advisor – A faculty member responsible for advising the students in the selection of their coursework and the scheduling of milestones necessary to complete the degree objective.

Appropriate Professional Conduct – A term that includes the behavior, communication style and physical presentation of the student. Students must act with absolute integrity and honesty in their academic work. Evidence of unethical behavior, including falsifying data, claiming another person's work as your own, or otherwise compromising our educational or research mission, may be grounds for immediate dismissal from the educational program. Students are also expected to behave civilly towards other members of our community and adhere to the rules and guidelines established by the University. Communication with other members of the community should respect the dignity and experience of each individual and not create hostility beyond intellectual disagreement. Students should dress and act within the standards appropriate for a professional at a university.

Courses Approved for Graduate Credit – Generally includes coursework at or above the 3000-level as accepted by the Graduate College. Typically, this does not include Industrial Engineering Design Project (ISE:4600), Graduate Seminar: Industrial Engineering (ISE:5000), Individual Investigations (ISE:5998), department electives, or approved courses from other departments, except by permission. For specific details see Section V. Degree Requirements.

Department Executive Officer – The Department Executive Officer (DEO), sometimes referred to as the Chair, Department Chair, or Chairman, is the administrative head of the Industrial and Systems Engineering Department, which administers all of the Industrial Engineering educational programs. The position is nominated by the members of the department faculty and appointed by the Dean of the College of Engineering.

Director of Graduate Admissions - The Director of Graduate Admissions (DGA) is an ISE faculty member responsible for overseeing the graduate recruiting activities and the graduate admissions procedures in the department.

Director of Graduate Studies – The Director of Graduate Studies (DGS) is head of the graduate program and serves as the initial advisor for incoming graduate students.

Examining Committee – A group of members of the Graduate College faculty empowered to evaluate the performance of a student during a qualifying or comprehensive exam or the successful completion of a thesis or dissertation.

External Committee Members – A member of an examining committee who is not a faculty member of the Department of Industrial and Systems Engineering.

Faculty Advisor – A faculty member who serves as both an academic and research advisor.

Final Examination – The final defense of the M.S. thesis or Ph.D. dissertation, presented before the examining committee.

Full time registration – Nine semester hours in a regular semester constitutes full-time registration.

Good standing – Student status as defined by the Manual of Rules and Regulations of the Graduate College. Standing with respect to the Graduate College is determined by GPA. This is merely one component in the determination of whether or not a student is "meeting expectations" (see definition below).

Graduate Admissions Committee – A committee of Industrial and Systems Engineering faculty members responsible for making admission decisions to the graduate program.

Graduate Student Review of Progress – A form that tracks a student's degree progress, to be completed by each graduate student and their academic advisor each year and delivered to the DEO.

In Residence – Status applied to students making demands on departmental or University facilities and resources (i.e., using faculty time, office space, laboratory space, computer resources, shop facilities, etc.). "In residence" status is based on use of University resources and not on whether the student is living in the Iowa City area. Students working remotely or completing research off site can be classified as in residence.

ISE Graduate-Level Courses – ISE Program Courses at the 5000-level or higher, not including Graduate Seminar. These are courses intended for ISE graduate students. See also Courses Approved for Graduate Credit and Section XII, Appendix C: ISE Courses Approved for Graduate Credit and Focus Areas.

ISE Program Courses – Courses with an administrative home in the Industrial and Systems Engineering Department. This does not include courses taught by other departments that are cross-listed as ISE courses.

Meeting expectations – Student status as determined within the Department of Industrial and Systems Engineering, achieved by students who simultaneously meet four criteria: "good standing" within the Graduate College; "satisfactory performance;" "normal progress;" and "appropriate professional conduct." The terms "satisfactory performance," "normal progress," and "appropriate professional conduct" are defined in this section as well as in the section on student evaluation (Section VII).

Minimum Registration Requirements - Enrollment in at least 1 semester hour (research or coursework) in every fall and spring semester up until the semester of graduation. This is generally accomplished by registering for the ISE Graduate Seminar (ISE:5000). Summer registration is required only under special circumstances.

Normal progress – A term indicating that the student is completing appropriate courses in an appropriate sequence in the expected timeframe, passing educational milestones, such as the comprehensive exam and qualifying exam at the appropriate times, and producing research products, such as completing research experiments and analyses, writing conference papers and journal articles, and writing thesis chapters, in timeframes consistent with their degree and status.

Not meeting expectations – Student status within the Department of Industrial and Systems Engineering, applied to any student failing to meet one or more criteria from the following list: “good standing” within the Graduate College, "satisfactory performance," "normal progress," and "appropriate professional conduct."

Plan of Study – A form showing which courses a graduate student has taken and is planning to take in order to satisfy the graduation requirements.

Probation – Student status as defined by the Manual of Rules and Regulations of the Graduate College. Students not in good standing with respect to the Graduate College are on probation.

Program GPA – The average (on a 4-point scale) of grades in courses used to satisfy the Industrial and Systems Engineering graduate coursework requirements, excluding seminars and research hours (IE/ISE:5999 and IE/ISE:7999). The program GPA may include courses taken in other departments that are part of the coursework for the IE degree. Students may have courses, such as recreation or elective courses, that will not count towards their degree, and therefore will not affect their program GPA.

Research Advisor – A faculty member who oversees a student’s research efforts on a day-to-day basis and is the thesis supervisor, which appears as the first faculty signature on a student’s thesis.

Satisfactory performance – A term indicating that the student is achieving appropriate grades in appropriate courses, adequately completing research tasks in a timely manner, and completing other normal duties associated with being a graduate student, such as attending seminars and meetings, completing paperwork, and responding to emails in a timely manner.

III. Admission

A. Requirements and Procedures

Admission to the graduate program of the Department of Industrial and Systems Engineering is competitive and is based on an applicant's previous coursework, research, and industrial experience. The general admission standards outlined below are intended to maintain the quality of the graduate program and to ensure sufficient preparation required for timely degree completion. Specific admission standards may be waived by the graduate admissions committee when other evidence of competence is compelling. These standards are minimum standards, thus meeting these standards does not ensure admission to the program. Admitted students typically exceed these standards.

Applicants to the graduate program are expected to have a minimum cumulative grade point average of 3.00/4.00 with a B.S.E. degree in Industrial Engineering or a related science or engineering discipline.

A GRE score is optional for admission to the PhD program. A combined Quantitative Reasoning and Verbal Reasoning Score of 300 is expected. The GRE Advanced Examination in Engineering is not required for admission to the program; however, these scores should be forwarded to the department if the Advanced Examination is taken. The GRE is not required for applicants to any of the MS programs, including the BSE/MS (U2G) program.

International applicants who do not speak English as their native language are required to submit the results of the TOEFL examination. Applicants who have completed a post-secondary degree at an English-speaking institution may request a waiver to this requirement. A minimum TOEFL score of 100 is required, which is higher than the Graduate College minimum of 81.

Applicants must arrange to have three letters of recommendation sent to the department through the admissions website. These letters should be completed by persons who are well acquainted with the applicant and their ability to undertake graduate work in industrial or systems engineering. Applicants to the UG2 program need only submit one letter of recommendation from their prospective advisor.

While the department will consider applications at any time, first consideration is given to students who have their application materials, including their application, transcripts, GRE scores, TOEFL scores, and the required letters of recommendation, completed by the admission priority deadline as found on the application website.

The Director of Graduate Admissions (DGA) is responsible for overseeing the graduate recruiting activities and the graduate admissions procedures in the department. The DGA serves as the point of initial contact between prospective graduate students and the department and maintains a record of each qualified applicant in the department office. The DGA, in consultation with the graduate

admissions committee and the Department Executive Officer (DEO), screens the applicants and ultimately determines which applicants will be extended offers of admission.

B. Applicants with Degrees Outside Industrial or Systems Engineering

The department encourages students with degrees in other scientific disciplines, such as computer science, mathematics, physics, or other engineering disciplines, to apply for admission to the graduate program. Some students have already completed M.S. degrees. However, these students are expected to attain a proficiency in specified core areas of industrial and systems engineering equivalent to entering graduate students who hold a B.S.E. degree in industrial engineering. The background of each student admitted to the program with a degree not in industrial or systems engineering will be reviewed by the faculty. These proficiencies are intended to ensure that each admitted graduate student is able to fully participate as a graduate student in all ISE discipline areas at some level, even while advanced courses in certain areas may not be immediately accessible to all graduate students. The Director of Graduate Studies will specify in writing any remedial courses that will be required of the student. Examples of core undergraduate courses include:

Mathematics

- Calculus (MATH:1550, MATH:1560 or equivalent)
- Matrix Algebra (MATH:2550, MATH:2700 or equivalent)
- Probability and Statistics for Engineers (STAT:2020 or equivalent

Core Engineering Courses

- Introduction to Engineering Computation (ENGR:1300 or the equivalent)

Written approval from the Director of Graduate Studies and the Department Executive Officer is required to grant credit toward graduate requirements and is given on a case-by-case basis. Introductory undergraduate courses are not appropriate for meeting graduate program requirements.

C. Degree Program Selection

Unless otherwise specified, graduate students in the Department of Industrial and Systems Engineering are enrolled in the M.S. non-thesis track. If a student and faculty member have already jointly agreed to pursue the M.S. with thesis option, the student may be admitted into the thesis track. For students with an M.S. degree from another institution, they will be admitted to the Ph.D. track.

IV. Advising and Program Planning

A. *Advisors*

There are three types of advisors. The academic advisor is a member of the tenure-track ISE faculty members responsible for advising students in the selection of their coursework and the scheduling of milestones necessary to complete the degree objective. The research advisor is a faculty member (either internal or external to the Department) who oversees a student's research efforts on a day-to-day basis and is the thesis supervisor, appearing as the first faculty signature on a student's thesis. The term "faculty advisor" describes an ISE faculty member who serves as both an academic advisor and a research advisor.

For non-thesis M.S. students, an academic advisor will be initially assigned by the department. M.S. with thesis and Ph.D. candidates generally have research advisors already. If the research advisor is outside the department, an academic advisor may be nominated by the student after discussion with their research advisor and ultimately assigned by the DEO. These nominations are due at the end of the 6th week of the first semester entering the program. Academic advisors evaluate the performance and progress of their advisees and maintain consistency and adherence to the rules and traditions of the graduate training program in the department. Academic advisors typically serve as the chair of the student's examining committee for their qualifying, comprehensive, and final examinations.

The research advisor must be a member of the Graduate College. The research advisor is responsible for the student's development in terms of research skill and success in publication. Research advisors external to the Department of Industrial and Systems Engineering who wish to serve as committee chair are advised to consult with the DEO as soon as possible before making research commitments to students. Typically, research advisors serve as the thesis supervisor and are responsible for the student's successful production of their research thesis. The philosophy of the department is to nurture and encourage productive research relationships that ensure student growth, timely progress to degree completion, provide training for the student's career objective, and advance the quality of the research program.

Initially, the Director of Graduate Studies will orient the student to the policies and procedures of the department and assist the student in adjusting to graduate student life. In some cases, graduate students may already be working closely with a particular faculty member, in which case they may be confident about who they would like their advisor to be. In other cases, students will need some time to get to know the faculty before choosing an advisor. Students can typically begin as non-thesis master's students and may change their status upon consulting with their academic advisor. The Director of Graduate Studies will help introduce students to opportunities, but the expectation is that students should be invited to pursue a thesis or dissertation, rather than presuming entitlement to these advanced studies.

B. *Examining Committee*

In addition to the academic advisor, each student in the M.S. with thesis and Ph.D. programs has an examining committee. The examining committee assists the student in their graduate research, evaluates progress, administers examinations, and approves the M.S. thesis or Ph.D. dissertation. Because the examining committee plays such a vital role in advising students through the course of their graduate studies, it is important that examining committees be selected with care. In most cases, the academic advisor serves as the committee chair. The graduate student and the academic advisor together should identify committee members willing to serve and who meet Graduate College and departmental requirements. The names of these faculty members are forwarded to the DEO, who then recommends the examining committee to the Dean of the Graduate College. The Dean of the Graduate College formally appoints the student's examining committee.

1. M.S. Non-Thesis Examining Committee

No examining committee is required for a non-thesis M.S. degree candidate.

2. M.S. Thesis Examining Committee

An M.S. thesis examining committee is required to acknowledge the satisfactory completion of the comprehensive exam and to approve the final text of the thesis. An M.S. thesis committee has a minimum of three members of the graduate faculty. At least two of those three members must be Industrial and Systems Engineering tenure-track faculty. Members of the instructional faculty, lecturers, visiting scholars, and clinical-track faculty may serve on an M.S. thesis committee if their nomination for an appointment has been approved by the Graduate College. One of the three members of the graduate faculty may be replaced by a recognized scholar of professorial rank from another academic institution, with the permission of the Dean of the Graduate College.

3. Ph.D. Examining Committee

The Ph.D. examining committee is required to acknowledge the satisfactory completion of the comprehensive examination, the final examination, and to approve the final text of the Ph.D. dissertation. Typically, the same faculty group performs all three functions. A Ph.D. committee has a minimum of four members of the graduate faculty. At least two members must be Industrial and Systems Engineering tenure-track faculty and at least two members must have a formal appointment of any type in Industrial and Systems Engineering. At least three members must be tenure-track faculty at the University of Iowa. By tradition, at least one of the members should not have any formal appointment in the Department of Industrial and Systems Engineering. Members of the instructional faculty, lecturers, visiting scholars, and clinical-track faculty may serve on an M.S. thesis committee, if their nomination for an appointment has

been approved by the Graduate College. One of the four members of the graduate faculty may be replaced by a recognized scholar of professorial rank from another academic institution, with the permission of the Dean of the Graduate College.

C. *Graduate College*

The University of Iowa Graduate College is a partner with the ISE Department in the graduate educational process. The Graduate College is the degree granting body for all graduate degrees and not the ISE Department. The offices of Academic Affairs, Graduate Student Success, and Graduate Inclusion within the Graduate College are important resources that should not be overlooked when it comes to planning and advising. The Graduate College, in conjunction with the Registrar, maintains extensive deadlines, rules, and regulations for the completion and awarding of graduate degrees. Students with financial assistance or fellowships from the Graduate College may have reporting or other requirements specific to the Graduate College.

D. *Graduate Student Peer Mentoring Program and Engineering Career Services*

The Department maintains a peer mentoring program for all new graduate students. Mentors are solicited from the 2nd year and more senior graduate students each summer and paired with all new graduate students that have joined the program. The goal of the program is for each incoming graduate student to have a more senior graduate student (2nd, 3rd, or 4th year) who will contact the incoming student from time to time during the summer and throughout the first year of classes. This program is entirely volunteer-driven. The objective is to improve the first-year experience for incoming graduate students and help them integrate into the ISE department quickly and successfully. Some duties of mentors include:

- Initiate contact with your assigned new student(s) through e-mails messages.
- Contact your assigned student(s) at least once a week or once every other week to check in, answer questions, invite them to meet with you, etc. Many students have questions about transportation and housing that are best answered by peers (summer and fall semester)
- Contact your assigned student(s) as needed to offer support and check-in (spring semester)
- Offer to meet face-to-face to talk about the transition to graduate school

Benefits of mentoring include:

- The opportunity to make a positive difference in the lives of new graduate students
- Develop your interpersonal skills, communication skills, and ethical standards
- Meet new people
- Provide service to your University and academic program; receive many thanks from junior students, their families, and faculty

Engineering Career Services offers individual advising and class presentations on résumé and cover letter preparation, job and internship search strategies, interviewing skills, and job offer evaluation and negotiation. In addition to equipping students with the tools they need to navigate their internship, co-op, or full-time job search, Engineering Career Services also develops and promotes experiential education and professional opportunities for students in the College of Engineering. Professional staff coordinate the college's co-op and internship program, engage in employer outreach, and provide opportunities for students to network with employers in meaningful ways, including an engineering career fair each semester and other programming related to career development.

E. *Minimum Registration Guidelines*

The Graduate College Manual contains the complete rules and regulations on registration requirements and ISE graduate students are governed by them. The departmental guidelines below exceed those of the Graduate College. Advisor approval is required to deviate from the guidelines below. Registration requirements can be complex, as registration can affect financial aid packages, fellowships, insurance eligibility, taxation status, immigration status, student loan deferment eligibility, and/or graduation requirements. Please contact department administrators and your advisor for guidance on appropriate registration. Registration should accurately reflect student usage of faculty time, office space, laboratory space, shop facilities, etc.

Both Ph.D. and M.S. students must be registered for at least 1 semester hour (research or coursework) in every fall and spring semester up until the semester of graduation. This is generally accomplished by registering for the ISE Graduate Seminar (ISE:5000). Registration for the summer semester is not required unless the degree will be awarded during the summer or if the department deems registration is necessary.

Registration in “Doctoral Continuous Registration” or “Masters Continuous Registration” is not necessary for ISE students who are actively working toward their degrees. Enrollment in seminar is sufficient. “Doctoral Final Registration” and “Master’s Final Registration” may be appropriate in special cases but are not needed for students who graduate in the semester of their thesis defense. Please see your advisor and department administrator for more details.

V. Degree Requirements

A. *General Information for All Students*

All students are required to satisfy the general requirements of the Graduate College appropriate for their degree objective. In addition, all graduate students must submit a Graduate Student Review Form each academic year in residence to their academic advisor and to the Director of Graduate Studies and must periodically report progress to their examining committee. Specific reporting procedures should be discussed with the academic advisor and documented in writing. Students who fail to provide annual updates are subject to the withholding of research credit and/or reduction/termination of financial aid. Students who are not meeting departmental expectations are required to submit the Graduate Student Review Form to their advisor and examining committee each semester rather than annually.

Courses numbered below IE/ISE:3000 are typically introductory undergraduate courses and are not appropriate for ISE graduate credit. Undergraduate seminars, project courses, and independent studies, including: IE/ISE:3000, IE/ISE:3998, and IE/ISE:4600 generally do not count toward graduate credit. Technically relevant courses with numbering ISE:3XXX or higher may count toward graduate credit.

Credits that were earned more than 10 years prior to graduation (including transfer credits) are ineligible to count toward degree requirements, unless the student provides documentation validating that the knowledge and skills associated with those credits have been kept up to date through professional practice, continuing education, or other relevant practices. Acceptance of the old credits must be approved by both the ISE Department Chair and the Graduate College.

It is the responsibility of each student to submit a degree application by the Graduate College's deadline.

1. Requirement in Ethics

During the first semester, all graduate students must enroll in and complete the College of Engineering one-semester seminar course “Engineering Ethics” (ENGR:7270). U2G students may take the course in Year 1 if they ask for permission, otherwise they can enroll during Year 2. Students who begin in Spring can take Engineering Ethics in the subsequent Fall semester. Students with special circumstances that prevent the completion of this requirement must contact the Associate Dean of Research. Students enrolling in this course may request a waiver for the Industrial Engineering Graduate Seminar. The 1 s.h. from this seminar does not count toward the 5000 or above level courses for both MS and PhD students, or towards the 30 semester-hour degree requirement of approved graduate coursework for MS students but can count toward the 72 s.h. overall graduation requirement for Ph.D. students.

2. English as Second Language Testing

All new graduate students who wish to be eligible for a teaching assistantship and for whom English is not their native language are required to take the English Speaking Proficiency Assessment (ESPA) and the English Language Proficiency Assessment (ELPA), if appropriate, before or during their first semester in graduate school. The university defines certain proficiency levels on these tests for graduate students to be appointed to teaching assistant positions. Graduate students wishing to serve as a teaching assistant in their first semester must take these tests before the first semester begins, usually in mid-August. If the test results indicate that a student requires the remedial Teaching Assistant Preparation in English (TAPE) course, the department may or may not decide to cover the costs of the extra training, depending on the demand for teaching assistants.

3. ISE Graduate Seminar

All graduate students should enroll in the graduate seminar both Fall and Spring in their first year of study or 2 consecutive semesters after their admission into the program. Beginning second year of their study, all students should take the seminar at least once annually. For U2G students, they will take the seminar in their first 2 semesters in the graduate student status. Any exceptions to this will be evaluated on a case-by-case basis. Students do not need to enroll in the seminar during summer. Students can substitute graduate seminar for an internship experience or professional development course or training twice for PhD students, and once for MS students. The graduate seminar may be waived during the first semester for some students enrolling in Engineering Ethics (ENGR:7270), depending on the number of other credits they are taking in the same semester, in which case the students will enroll in the graduate seminar for 2 consecutive semesters after their first semester. Students failing to attend seminar regularly will receive a failing grade for the course. The 1 s.h. from this seminar does not count toward the 5000 or above level courses for both MS and PhD students, or towards the 30 semester-hour degree requirement of approved graduate coursework for MS students, but can count toward the 72 s.h. overall graduation requirement for Ph.D. students. Enrollment in Graduate Seminar is also sufficient to maintain residency after graduate students have completed all other course and research expectations for graduation. Exceptions to this requirement of seminar attendance must be approved in writing by the Department Executive Officer on a case-by-case basis. All PhD and MS Thesis graduate students are expected to present a seminar in ISE: 5000, typically during their 3rd or 4th year for PhD students and 2nd year for MS Thesis students.

4. Research Credits ISE:5999 / ISE:7999

Thesis-based M.S. students and PhD students are allowed to take *ISE:5999 Research: Industrial Engineering M.S. Thesis* or *ISE:7999 Research: Industrial Engineering PhD Dissertation* for experimental and/or analytical investigation of an approved topic for partial fulfillment of requirements for degrees in industrial engineering. It should be noted that ISE: 5998 and ISE: 7998 are not courses intended for research credits. *ISE: 5998 Individual Investigations: Industrial Engineering* is a course tailored for individual students.

Students are allowed to take ISE: 5998 typically no more than once during their study. A syllabus needs to be provided and approved by the DEO prior to registration in ISE: 5998. *ISE: 7998 Special Topics in Industrial Engineering* is a preliminary course for emerging topics in industrial engineering.

B. *Master of Science Degree Without a Thesis*

The Master of Science Degree in Industrial Engineering without a thesis requires a minimum of 30 semester hours in courses approved for graduate credit. At least 21 semester hours are required in Industrial and Systems Engineering program courses. All master's degree candidates (thesis and non-thesis) must take at least 12 semester credits of ISE Graduate-Level Courses, which are courses at the 5000 level or above that have an administrative home in the Department of Industrial and Systems Engineering. Courses may be selected with the advice and consent of the academic advisor. All master's degree candidates must maintain a program GPA above 3.25, which is higher than the Graduate College minimum.

All M.S. students must pass at least one course (3 semester hours) approved for graduate credit in each of the three focus areas 3000-level or above: Human Factors, Analytics, and Systems. Students with relevant academic background in these areas may be excused from this requirement by the DGS. Courses that count towards this requirement in each focus area are shown in the appendix of the graduate handbook (See Section XII: Appendix C: Focus Areas).

C. *Undergraduate-to-Graduate (U2G) Program*

Undergraduate students at the University of Iowa who have completed more than 80 s.h. and have a G.P.A. higher than 3.25 may apply for admission to the U2G program designed to accelerate the attainment of an M.S. degree in Industrial Engineering following an undergraduate degree, typically completing their M.S. degree within one year of completing their B.S.E. degree. Students are permitted to count up to 4 courses (12 s.h.) of their undergraduate work toward their graduate degree. Students admitted to the U2G program are also permitted to register for graduate seminar and work with a research advisor on a thesis project before completing their undergraduate degree. Students from undergraduate disciplines other than Industrial Engineering may be required to take remedial courses as part of their training, as described in Section III.B.

D. ***M.S. Thesis Option***

Non-thesis M.S. students may petition for entry into the M.S. thesis program or the Ph.D. program by requesting a change of status through the department. Typically, students make this request at the invitation of a faculty member who is ready to serve as a research advisor for the student. The request will be reviewed by the graduate admissions committee. The committee will forward approved requests to the Department Executive Office, who may authorize a change of status petition from the Department to the Graduate College.

Students are encouraged to write their thesis as a publishable journal article and submit the article for publication. While most scholarly journals allow prior publications to be used in theses, check with the journal in which the article was published to confirm whether a copyright permission is required to reproduce the work in the thesis. If you reproduce or adapt a published (or accepted) journal article or portions of a journal article in your thesis, you must cite the published work in the thesis, making sure to adhere to the journal's policy regarding the appropriate formatting for the citation.

The M.S. thesis option requires a minimum of 30 semester hours in courses approved for graduate credit. Students pursuing the thesis option may include up to 9 semester hours of Research: Industrial Engineering M.S. Thesis (ISE:5999) as part of the required 30 semester hours. At least 21 semester hours must be taken in the ISE program courses (including ISE: 5999, but not including seminar ISE: 5000), and at least 12 semester hours must be taken in ISE Graduate-Level Courses (ISE:5000+, but not including ISE: 5000). Up to 3 semester hours of ISE:5999 may count toward the ISE graduate-level course requirement. In addition, each student must submit the form entitled "Final Examination: Advanced Degree," complete a Report of Thesis Approval, and submit a copy of the thesis to the Graduate College, following the published guidelines and deadlines. The title of the thesis will appear on the student's academic record.

A student wishing to switch from the MS Thesis option to MS non-thesis option can only use up to 3SH of any thesis research credits. Approval by the DGS is required to switch the 3SH of thesis research credits towards the non-thesis degree.

E. *En Passant Option*

Students admitted to the Ph.D. program may elect to earn their Master of Science degree through the *en passant* option, with the permission of their Ph.D. committee. This option allows the candidate to write an English-language manuscript as the first author and submit it to a peer-reviewed research journal in lieu of writing the M.S. thesis. With this option, the student, in conjunction with their academic advisor, will author a paper that serves as the foundation for the candidate's Ph.D. research. The decision to select this option must be made before the qualifying examination. The committee may determine, based on the student's published or submitted scholarship to peer-reviewed journals, that the presentation of a separate research thesis is not necessary. In this case, up to nine credits of Research: Industrial Engineering M.S. Thesis (ISE:5999) may be counted towards the non-thesis option. Students choosing the *en passant* option will generally receive an M.S. degree without the thesis designation.

The en passant option is not intended for students who have a prior MS degree, and are pursuing a PhD degree. In the event a PhD student does not satisfy the qualifying exam requirements, regardless of whether they have a prior MS degree, the student may be eligible to receive a MS degree based on the advice and recommendation of their committee.

F. *Doctor of Philosophy Degree*

The Ph.D. degree is granted primarily on the basis of achievement rather than on the accumulation of semester hours of credit. Excellence in research is the principal requirement for the Ph.D. degree. It is expected that the Ph.D. dissertation research project represents an original and significant contribution to the body of knowledge in the field. At least one accepted research article as first author, with the research advisor as a co-author, in a peer-reviewed journal, in addition to presentation of their research in a departmental seminar, are requirements of graduation. Submission of three, first-authored papers and at least one research presentation at a national conference is typical. The Ph.D. candidate is normally expected to have completed three academic years of residence, or two years if the candidate already holds a recognized M.S. degree.

A Doctorate in Industrial Engineering requires a minimum of 72 semester hours in courses (including research credits ISE: 7999 and seminar ISE: 5000) approved for graduate credit beyond the B.S.E. degree. For students who earned their M.S. degree at the University of Iowa, no more than 36 semester hours from the M.S. degree may be counted toward the Ph.D. degree. For students who earned their M.S. from another institution, a maximum of 30 semester hours may be transferred into the doctoral program. At least 36 semester hours must be taken in the ISE program courses (including ISE: 7999, but not including ISE: 5000), and at least 24 semester hours must be taken in the ISE graduate-level courses (ISE:5000+, but not including seminar ISE: 5000). Up to 6 credits of ISE:7999 may count toward the ISE graduate-level course requirement. The DGS will review the transcripts of each new Ph.D. student to determine which of these requirements have been met from previous work. A Ph.D. candidate must have a program GPA of 3.50 to graduate.

In order to meet the breadth requirement, each Ph.D. candidate must pass at least 6 semester hours of coursework at the 5000-level or higher offered by the Department of Industrial and Systems Engineering in each of the three focus areas: human factors (two courses), analytics (two courses), and systems (two courses). Students with relevant academic background in these areas may be excused from the breadth requirement with approval from the DGS.

Ph.D. candidates are reminded that these are minimum requirements. The academic advisor and/or examining committee may impose in writing other requirements such as the completion of additional coursework or the acquisition of specific skills. The actual amount of coursework required is determined with the advice and consent of the academic advisor. There is no foreign language requirement.

In addition, each student must fulfill the qualifying requirement, pass the comprehensive examination, submit the form entitled "Final Examination: Advanced Degree," complete a Report of Thesis Approval, and submit a copy of the thesis to the Graduate College, following the published guidelines and deadlines.

G. *Examinations*

1. Ph.D. Qualifying Examination

The purpose of this qualifier is to determine the student's proficiency at research and scholarship. This is typically achieved within their first three semesters if starting without an M.S. degree, or within the first two semesters if starting with an M.S. degree. Once this requirement is passed, the PhD student can continue in the program towards satisfying other degree requirements.

The qualifying requirement begins by submitting either: 1) a master's thesis written by the candidate for the M.S. thesis option in Industrial Engineering; 2) an English-language manuscript written by the candidate as first author that has been submitted to a peer-reviewed research journal; or 3) a scholarly literature review manuscript describing recent research developments in a particular area of research interest relevant to the Ph.D. candidate. The scholarly literature review is typically more than 10 pages, includes citations of at least several dozen relevant research sources, and may include documentation of the candidate's own preliminary contributions to the research area. This requirement is typically met during the second semester of enrollment for all Ph.D. candidates.

The candidate will submit their work to a qualifying examination committee of 3 members of the ISE faculty, typically chaired by their academic advisor. This committee may choose to meet with the candidate and have the candidate answer questions about their work, either orally or in writing. The graduate committee will review the submitted materials as well as the candidate's transcript and determine whether the quality of their scholarship is sufficient to continue in the Ph.D. program. A first-authored, archive-quality, peer-reviewed manuscript that has been accepted for publication in a first-tier, English language journal in Industrial Engineering or a related

area is typically accepted as evidence of completing the qualifying examination. Although this is not required, the graduate committee will decide whether the candidate passes the qualifying examination on a case-by-case basis.

The qualifying examination may be reported as satisfactory, satisfactory with reservations, or unsatisfactory. Two or more unsatisfactory votes constitute a failure. A satisfactory with reservations report will state in writing the concerns of the committee and the specific courses, procedures, or other requirements to be satisfied by the student. The graduate committee will also specify in writing the deadline by which the student must fulfill these requirements. The qualifying examination may be repeated, at the discretion of the qualifying examination committee, at most one time, and not later than one year after an initial failure.

In the event a PhD student does not satisfy the qualifying exam requirements, regardless of whether they have a prior MS degree, the student may be eligible to receive a MS degree based on the advice and recommendation of their committee.

2. Ph.D. Comprehensive Exam

The general rules for the administration of the Ph.D. comprehensive examination are contained in the policies and procedures of the Graduate College. The tradition in the department is for the comprehensive examination to consist of a written and oral component. The student writes and submits a comprehensive examination document, usually called the dissertation research proposal, to each member of the examination committee 2 weeks before the examination date. During the examination, the student makes a roughly 30-minute presentation on the content of the research proposal. Committee members may ask questions regarding the proposal before, during or after the oral presentation.

Each student must demonstrate an ability to carry out creative individual research by completing and defending the dissertation research proposal. The research proposal typically includes a thorough review of relevant literature, a clear statement of the proposed research question or experimental hypotheses to be examined by the candidate, any results of preliminary work, and a clear timeline with specific tasks to be accomplished to complete the research. The examining committee will consider the quality and importance of the research questions, the student's preparation for addressing the questions, the proposed techniques, including the quality of preliminary work, and the feasibility of the proposed timeline.

This comprehensive examination will only be scheduled after the qualifying examination requirement has been satisfied. It is normally completed by the end of the third year of graduate study for students who entered without an M.S. degree, and by the end of the second year for students who entered with an M.S. degree. The examining committee will satisfy the rules of the composition of the Ph.D. committee as set forth in Section IV.B.3. The examining committee shall determine if the student is ready to commence dissertation research at the current state of preparation.

Having satisfactorily completed the comprehensive examination, the student is accepted as a candidate for the Ph.D. degree. The comprehensive examination may be reported as satisfactory, satisfactory with reservations, or unsatisfactory. Two or more unsatisfactory votes constitute a failure. A satisfactory with reservations report will state in writing the concerns of the committee and the specific courses, procedures, or other requirements to be satisfied by the student. The examining committee will also specify in writing the deadline by which the student must fulfill these requirements. The comprehensive examination may be repeated once at the discretion of the examining committee.

3. Final Examination – M.S. Thesis and Ph.D. Candidates

The general rules for the administration of the final examination, which is sometimes referred to as a thesis or dissertation defense, are contained in the policies and procedures of the Graduate College. The final examination is the defense of the thesis or dissertation as administered by the candidate's examining committee. The final examination consists of an oral presentation by the candidate of their research project, with typical uninterrupted presentation length of approximately 20-40 minutes, although committee members may interrupt the presentation to ask questions. The final examination is a critical inquiry into the purpose, methods, and results of the research and may include intensive examination in areas related to the investigation. Ph.D. and M.S. final examinations are open to the public. The final examination may be reported as satisfactory or unsatisfactory. Two or more unsatisfactory votes from examining committee members constitute a failure. The final examination may be repeated, at the discretion of the examining committee.

The final examination should be scheduled as early in the semester of graduation as possible in order to provide as much time to make the required corrections and additions to the thesis or dissertation that are required by the examining committee. In general, the thesis or dissertation must be distributed to the examining committee at least two weeks before the final examination date and the final examination should be scheduled no later than two weeks before the final deposit deadline.

The final examination must be passed within two years for M.S. thesis students. For Ph.D. students, the final examination must be passed within three years of passing the comprehensive examination and no later than four years after entry into the graduate program with an external M.S. degree. Failure to meet this deadline indicates that the student is failing to make appropriate progress in the program, which may lead to reduced financial aid or dismissal from the program. Please note that additional requirements for normal progress (which may be stricter than those above) are described later in the "Student Evaluation" section of this handbook (Section VII).

4. M.S. Thesis and Ph.D. Dissertation

The Graduate College has established a number of guidelines for theses and dissertations, which students are required to follow. Dissertations and theses should contain three sections: an introductory chapter; a chapter, or chapters, containing the body of a publishable manuscript (one per chapter), and a concluding chapter. The introductory chapter will outline the larger problems addressed

in the research, discuss the purpose and major goals of the research, and (if requested) contain a comprehensive literature review of the research area. The draft manuscript should contain publishable manuscripts. Typically, a master's thesis has content equivalent to roughly one journal article, while a dissertation contains work equivalent to roughly three journal articles. Each chapter will be written with a target journal in mind, and the level of detail, headings, and so forth should reflect that journal's requirements in order to minimize the need for revisions when the manuscripts are sent out for review. The concluding chapter explores and illuminates the larger challenges mentioned in the introduction, addresses the significance of the research to the field of industrial and systems engineering, describes any aspect(s) of the research not included in the manuscript but worthy of discussion, and discusses the potential for future research.

Your deposit must be submitted by the established deadline date for a given semester. Please do not wait to submit your thesis or dissertation until the day of the deadline. This will give the Graduate College time to review the thesis or dissertation to determine if it is complete, and to notify you if there are missing materials that need to be submitted before the deadline. Failure to submit the thesis or dissertation by the deadline established by the Graduate College will result in the postponement of graduation to a future session. This may also require the student to pay in order to be enrolled during the semester in which they graduate.

At the time of deposit, your thesis or dissertation must be complete and in final form. Your thesis or dissertation must include all edits or changes requested by your examining committee as a result of your defense. It must also include all required manuscript elements—including properly formatted preliminary pages—and meet all additional formatting requirements.

Electronic submissions (ProQuest): You will submit your thesis or dissertation to the Graduate College via ProQuest. More information about the process—and information about copyright, fees, and submitting your public abstract—can be found here. Once you submit, you should receive an e-mail confirmation from ProQuest. If not, please call (319) 335-2144 to make sure your submission has been received. Remember, it is your responsibility to meet the deposit deadline.

Students must adhere to all deadlines, with particular attention to those established by the Graduate College for thesis/dissertation deposits and for the timing of the final examination, including providing committee members with a copy (electronic or printed, depending on the committee members' preferences) two weeks before the final examination.

H. *Department Graduation Checklist*

After final deposit of the thesis or dissertation, the student must submit a completed Departmental Graduation Checklist to your advisor three days before the semester commencement exercises. Failure to submit a Graduation Checklist will result in a hold placed on your graduation records. Consult with your advisor on this checklist.

I. *Graduation Checklist*

Student to Department

- Return all keys to department administrator.
- Satisfy all financial debts to the department.
- Provide a forwarding address.

Student to Advisor and Laboratory

- Make arrangements with advisor to assure that all originals (or copies if approved by advisor) of logbooks, laboratory manuals, experimental data, computer codes, etc. are turned in to the academic advisor.
- Submit an electronic copy of thesis/dissertation to advisor.
- Return all books, journals, papers and other items borrowed from advisor, except as agreed between the advisor and student.
- Return all instrument operation manuals, safety instructions, procedures, and maintenance records to advisor.
- Return all supplies and equipment borrowed from other laboratories.
- Report all broken instruments.
- Report supplies that need to be ordered.
- Leave all research equipment that is not in continuing use, in condition for indefinite storage or immediate disposal.

Note: Graduating students are not permitted to take any University supplies, manuals, handbooks or other items from the laboratory, except with permission from the supervising faculty member.

Student Signature and Date:

Advisor Signature and Date:

VI. Financial Assistance

A. *General*

The department encourages both self-funded students and students that receive financial support either by working as teaching assistants or research assistants. Although most financial aid is provided in the form of teaching and research assistantships where service to the University is required, the graduate student stipend is viewed primarily as financial aid rather than the remuneration for services rendered. In addition, the graduate assistantship provides an important educational opportunity for students to obtain experience in teaching and research.

B. *Sources of Support*

The funds available for graduate assistantships are primarily through sponsored research contracts and grants obtained by faculty members. Other funds are provided to the department by the College of Engineering and the Graduate College. In general, there are no departmental funds for summer support. Therefore, summer support for students can only be provided from external funds. Consult your academic advisor on matters regarding summer support.

C. *Eligibility*

Subject to the availability of funding, it is the policy of the department to provide or arrange financial assistance for each Ph.D. graduate student who is meeting departmental expectations. Non-thesis M.S. students are generally not provided financial aid. Department M.S. students pursuing a thesis will be provided with financial aid if funds are available, but at a lower priority than Ph.D. students.

The University requires all first-time teaching assistants whose first language is not English to be tested to assess their English speaking and comprehension skills and general suitability for teaching undergraduates before they are assigned assistantship responsibilities. All incoming graduate students are screened by the Director of Graduate Studies as to whether testing in English is required for certification of oral competency. Students who mark English as their first language on their application may still be required to take testing, depending on the discretion of the Director of Graduate Studies. The Department of Linguistics administers these exams each semester and summer session the week prior to registration. Students are given detailed information and instructions about the tests and are able to ask questions when they register to take the tests.

To ensure excellence in research, full-time graduate students appointed to positions of half-time or greater may not be employed outside of the department, except through professional training programs approved in advance by the department. Students violating

this provision will be ineligible for financial aid. Students who feel this provision causes unusual hardship may request an exception from the department. However, the nature and duration of the hardship must be fully documented, and the student must be able to maintain "normal progress," as outlined in Section VII.D. of this handbook.

D. *Duration of Eligibility*

For students entering without previous graduate work, it is the aspiration of the department to continue support for up to five years for a Ph.D. student and up to two years for an M.S. with thesis student so long as that student is “meeting expectations.” For students entering with previous graduate work, the duration of support will be prorated (reduced) with respect to the student’s initial placement in the graduate program. It is to be emphasized that the uncertainty regarding the funding of graduate education by state and federal agencies makes it impossible to guarantee the level and duration of support for any student. Financial support during a sixth year in residence for a Ph.D. student (third year for M.S. student) meeting expectations may be arranged upon the recommendation of the student’s research advisor. Funding is subject to funds available after all other eligible students have been supported. Students who fail to maintain normal progress may become ineligible for support. A Ph.D. student who has been supported for six years (or M.S. for three years) from sources provided or arranged by the department, or requiring departmental approval, will not receive continued support from such sources (including external research grants and contracts obtained by the research advisor). Exceptions to this policy will require a formal appeal by the student, which must be approved by the faculty.

E. *Assistantship Responsibilities*

1. Research Assistantship Activities

Each student in the Ph.D. or M.S. with thesis programs will participate in research activities of some type during each semester in residence, except when the individual has been assigned an unusually demanding teaching assistantship. Research assistantship activities are intended to give the student direct and continuing experience in the actual research process, from formulation of the study through collection and analysis of data and preparation of a scholarly paper. These activities are intended to facilitate the research progress and productivity of the faculty member and the research group with which the student is associated. The research performed under a research assistantship may or may not be related to the student’s thesis work. Since thesis research activities are concerned with matters of originality, creativity, and excellence, they are not subject to the hours per week guidelines of the general assistantship requirements.

2. Absences and Vacation

Unlike undergraduate students, Ph.D. or M.S. with thesis graduate students and faculty have research and/or teaching duties on a continuous basis including those periods when classes are not in session (e.g., winter and spring break). Graduate students receiving financial support must observe normal University business hours. At the very least, this means assistantship duties should be carried out from Monday to Friday, 9 a.m. to 5 p.m. Students must discuss the possibility of alternative working hours with the research director (R.A.) or the instructor (T.A.) in charge. The research director or instructor in charge should be notified of absences due to illness or family emergency as soon as possible. Graduate students should behave professionally, notifying colleagues and supervisors in advance of planned absences. Students absent for extended periods without approval will become ineligible for departmental financial aid. Graduate students may take paid leave or vacation as outlined by University guidelines and the collective bargaining agreement between the University and the union representing graduate and teaching assistants at the University. Current guidelines allow five working days of paid leave for academic year appointments and fifteen days of paid leave for fiscal year appointments. Typically, such vacation should be taken between academic semesters and must be approved by the student's research advisor. Students cannot accumulate vacation from year to year.

3. Assignment

The awarding of financial support is made by the department at the beginning of each semester. The department primarily recognizes three levels of assistantship activities— 1/8 time, ¼-time and ½-time. One-half time assignments require about 20 hours per week. Quarter time assignments require about 10 hours per week. Eighth-time assignments require 5 hours per week, do not include a tuition waiver and are reserved for non-thesis M.S. students. Specific assistantship assignments are made each semester. For teaching assistantships, the T.A. will be notified as early as possible, in writing, of the course(s), the instructor in charge, the beginning and ending date of the teaching appointment, and the duties to be carried out. For research assistantships involving research not related to the student's thesis work, the R.A. will be notified as early as possible, in writing, of the project(s), the research director, the beginning and ending date of the research appointment, and the duties to be carried out. For research assistantships involving thesis work, the graduate student is supervised by their academic advisor until the completion of all degree requirements.

In the assignment of financial support, due consideration is given to the interests and capabilities of the students. However, it is necessary to weigh this against the needs of the department and the requirements of the various funding agencies that support departmental research activities. The department makes assignments according to the following procedures:

The DEO presents a list of students eligible for financial support and a list of teaching appointments available to the faculty for consideration. Faculty members with external research support inform the DEO of the student(s) to be supported from their research grants. The DEO makes the final assignment of the teaching assistantships based on the needs of the departments, requests of the faculty, and preferences of students. Priority is given first to Ph.D. students and then to M.S. (thesis) students.

4. Renewal and Termination

Renewals (Reappointments)

Appointments to assistantships or traineeships are for a fixed period, usually one academic year. Sometimes the appointment may be made for one semester or 11-12 months. Renewal of an appointment for a subsequent period is based on the evaluation of the academic advisor and the collective judgment of the faculty concerning the student progress and professional conduct. It is emphasized that all renewals are contingent on the continued availability of state, federal, and project funds for student support.

Termination during the Term of an Appointment

A graduate student on an assistantship or traineeship may be dismissed during the term of that appointment. Loss of student status triggers termination of the appointment. A graduate student may be dismissed from an assistantship or traineeship appointment during the term of the appointment, without necessarily losing student status, for 1) any reason sufficient to dismiss a faculty member during the term of an appointment (see University Operations Manual); or 2) failure to follow or implement properly and adequately reasonable instructions of the supervisor when such instructions are within the proper scope of the supervisor.

F. *Tax Status*

The University is required by federal regulation to withhold income tax from money paid from University sources and from project grants. The University will provide an annual W-2 form showing the amount withheld. The tax status of these payments, in whole or in part, is subject to interpretation of the Internal Revenue Service Code. Each individual taxpayer bears the responsibility of filing an income tax report according to the individual's situation and applicable status.

G. *Collective Bargaining Agreement*

The terms and conditions of employment, including but not limited to wages and benefits, in this position are governed by a collective bargaining agreement between the Board of Regents, the State of Iowa, and UE Local 896/COGS, the union representing graduate teaching and research assistants at the University of Iowa. Copies of this collective bargaining agreement will be provided upon your appointment and may be viewed from the University web site: http://hr.uiowa.edu/bargaining/cogs.

H. ***Special Requirements***

To comply with the Immigration Reform and Control Act of 1986, the department and the University must verify the citizenship status or employment authorization of all persons hired after November 6, 1986. Each student employed by the department must present documents that verify his/her identity and eligibility for employment. A departmental authority must physically examine the documents and verify their authenticity and that they relate to the individual to be employed. Both the student and the department must complete the appropriate sections of Form I-9.

The following documents may be used to establish both identity and eligibility for employment: U.S. passport, a certificate of U.S. Citizenship, a Certificate of Naturalization, an unexpired foreign passport with attached employment authorization, and an alien registration card with photograph.

The following documents may be used to establish identity only: State-issued driver's license or personal identifying information such as name, sex, date of birth, height, weight, and color of eyes, a U.S. military card, Native American tribal documents, a school identification card with a photograph, a voter registration card, and an identification card issued by a federal, state, or local government agency.

The following documents may be used to establish employment authorization only: a social security card, an unexpired reentry permit, an employment authorization document issued by the Immigration and Naturalization Service, a birth certificate issued by a State, county or municipal authority bearing a seal or other certification, and Native American tribal documents.

VII. Student Evaluation

A. *General Overview*

Each fall, the graduate committee will evaluate the progress of each graduate student to determine whether students are meeting departmental expectations. The faculty will base their decision on academic record, performance in carrying out the responsibilities of a research or teaching assistantship, evaluations from faculty members, individual development plans and the graduate student review form, which are detailed in the next sub-section and is defined in the Terms and Definitions. In addition, the faculty will determine the level of financial support to be provided (continued, increased, reduced, or eliminated), whether the student should be placed on or removed from probation, or in some cases, be terminated from the program. This evaluation will also document progress toward fulfilling the requirements of the degree objective. A student who disagrees with the evaluation may submit a letter to the Department Executive Officer (DEO) stating their reasons. This letter will be attached to the evaluation and will become a part of the student's record.

B. *Individual Development Plan*

Individual Development Plans (IDPs) provides a process to identify professional development needs and career objectives. Furthermore, the IDPs can help with communication of goals between individuals and their mentors. It is not a performance evaluation tool.

Goals

Help individuals identify:

- Long-term career options they wish to pursue and the necessary tools to meet these

goals;

- Short-term needs for improving current performance.

Basic Steps

1. Conduct a self-assessment.
2. Survey opportunities with mentor.

3. Write an IDP, share IDP with mentor and revise.

4. Implement the plan and revise the IDP as needed (at least annually).

Documentation and Deadlines

Each graduate student must complete an IDP annually in Fall using the appropriate IDP form available on the Graduate Seminar ICON site. Each graduate student will receive an email outlining the process from the DGS or ISE departmental administrator. The instructions for completing an IDP can also be found on the ICON Dropbox. Each student must complete the IDP process by October 1st of each year, unless otherwise communicated. Upon completion of the IDP annual review, both the student and mentor keep copies, and the student submits the completed form (including mentor comments) to the appropriate ICON dropbox.

C. *Graduate Student Reviews and Regular Meetings*

All students shall report their research activities and document their progress toward their degree objective through the use of a Graduate Student Review. For students "meeting expectations," annual reviews are due by March 1st of the spring semester. For students not meeting expectations, a review is required during both the fall and spring semesters (due by the 6th Friday of each semester). These reports are to be submitted using the template provided by the department. Advisors may add additional questions or sections to the review form. One copy is supplied to the advisor and one copy to the department administrator. Documentation and supporting material may also be required to supplement the review. Each review will become a part of the student record maintained in the department office. Timely submission of the review is required to be eligible for financial aid.

All graduate students are required to meet annually with members of one of two committees: (1) the graduate committee; or (2) the thesis/dissertation examining committee. The graduate committee consists of the Director of Graduate Studies as well as other faculty members who are appointed by the DEO each year. The examining committee is formed by both M.S. thesis and Ph.D. students. The Graduate Student Review serves as the foundation of this review process. Students who are "not meeting expectations" should hold meetings each semester until good standing is reestablished. In addition to research requirements, students are to consult their advisors regarding coursework completed or planned to ensure that degree requirements are being met in a timely manner. The evaluation and recommendations of the advisor of student progress, both research and coursework requirements, becomes a part of the Graduate Student Review form.

Non-thesis M.S. students will meet with the graduate committee. Thesis M.S. students should always meet with their examining committee due to the compressed nature of the M.S. thesis timeframe. Ph.D. students can meet with their examining committee for all formal requirements. Meetings should be completed by the Friday of the 10th week of the semester in order to prevent end-of-semester scheduling conflicts and to allow committees to approve degrees where appropriate. When scheduling conflicts prevent a meeting with a full examining committee, a meeting with a partial committee is permitted, although a written report summarizing the meeting should be circulated to all members of the examining committee within one week after the meeting. Participation by the examination committee members who are not appointed in the Department of Industrial and Systems Engineering is not expected on an annual basis. Separate annual meetings are not required in years with comprehensive examinations or final examinations.

D. *Requirements for Meeting Expectations*

Students are classified as “meeting expectations” or “not meeting expectations” based on the following criteria. See the Terms and Definitions for additional explanations.

- ***M.S. Program***
  - A program GPA of *at least 3.25*. The department standard is higher than the 2.75 minimum required by the Graduate College.
  - Generally good performance in research productivity (based on the written evaluation of the academic advisor and/or research director).
  - Generally good performance in teaching assistantship activities (based on the written evaluation of the supervising professor).
  - Progress towards coursework related degree requirements (SH, breadth, research credit requirements)
  - Attendance of Graduate Seminar (ISE:5000) as described in Section V of this Handbook.

- ***Ph.D. Program***
  - A program GPA of *at least 3.50*. The department standard is higher than the 3.0 minimum required by the Graduate College.
  - Generally good to excellent performance in research productivity (based on the written evaluation of the academic advisor and/or research director).
  - Generally good to excellent performance in teaching assistantship activities (based on the written evaluation of the supervising professor).
  - Progress towards coursework related degree requirements (SH, breadth requirements)
  - Attendance of Graduate Seminar (ISE:5000) as described in Section V of this Handbook.

E. *Normal Progress*

The length of time required to complete a degree program will vary depending on considerations such as previous degree(s) awarded, background, conditional or regular admission, full or part-time status, degree objective, and plan of study. The rate of progress normally expected is such that a resident full-time student would complete an M.S. program in one to two calendar years after the B.S.E. and the Ph.D. program in four to five calendar years after the B.S, or within three years if entering the program with an M.S. degree. Course selection and registration will be determined in consultation with the academic advisor. The guidelines for "normal progress" for each degree objective are listed below. See also Appendix B: Expected degree progress.

1. M.S. Non-Thesis Program

Semester 1

The student is advised by the academic advisor. With the advice and consent of the DGS or their academic advisor, the student registers for 12-15 s.h. of coursework. A plan of study listing the courses for all semesters anticipated prior to graduation should be created by the student, approved by the advisor, and filed in the student record. During this semester, students will register for ENGR: 7270:0001: Engineering Ethics (1 s.h.) and ISE:5000: Industrial Engineering Graduate Seminar (1 s.h.) although the department may grant a waiver for Graduate Seminar during the first semester of enrollment for those students taking Engineering Ethics.

Semester 2

The student should meet with their academic advisor during the first two weeks of the semester. The student again registers for 12-15 s.h. of coursework and monitors progress toward fulfilling the degree objectives alongside the advisor. During this semester, students will again register for the Industrial Engineering Graduate Seminar (ISE:5000). Summer registration is not required for the non-thesis master's student, and securing of internships or external research opportunities is highly encouraged.

Semester 3 (Optional)

Students may register for 6-15 s.h. of coursework during an optional third semester with the approval of their academic advisor. Failure to complete an M.S. non-thesis degree within three semesters may constitute failure to meet normal progress, depending on the advisor's discretion. By the end of the third semester the student will have completed 30 s.h. of coursework. Check ISE seminar requirements starting second year of study in section V of this handbook.

2. M.S. Thesis Program

Semester 1

The student is advised by their academic advisor. With the advice and consent of their academic advisor, the student registers for 9-12 s.h. of coursework, and 0-3 s.h. of research. During Semester 1, the student will also form their examining committee. The student will typically complete a full literature review, learn necessary research methods and techniques, and perform preliminary experimental work. During this semester, students will also register for ENGR: 7270:0001: Engineering Ethics (1 s.h.) and Industrial Engineering Graduate Seminar (ISE:5000), although the latter course may be waived with permission from the department for students enrolled in Engineering Ethics.

Semester 2

Coursework and research continues. Students will enroll in Industrial Engineering Graduate Seminar (ISE:5000) as well as 3-12 s.h. of coursework and 6-9 s.h. of research (for a minimum of 12 total s.h.). The student works with the advisor and examining committee in preparation for the thesis defense. Students are expected to defend their thesis before the examining committee between the 6th and 10th weeks of the semester.

Semesters 3 and 4 (Optional)

Students may register for 0-9 s.h. coursework and 3-6 s.h. of research during an optional third and/or fourth semester with the approval of their advisor. Depending on the progress made in coursework and research, the student should complete the thesis and pass the final examination in the third or fourth semester of registration if they have not finished in the initial two semesters. Students shall defend their thesis before the examining committee in accordance with the Graduate College deadlines. By the end of the third or fourth semester, the student will have completed 21 s.h. of coursework and 9 s.h. of research. Check ISE seminar requirements starting second year of study in section V of this handbook.

3. M.S. Thesis Program with 50% RA/TA or part-time

Semester 1

The student is advised by the academic advisor. With the advice and consent of their academic advisor, the student registers for 6-9 s.h. of coursework and 0-6 research hours. A plan of study listing the courses for all semesters anticipated prior to graduation should be created by the student, approved by the advisor, and filed in the student record. During this semester, students will register for ENGR: 7270:0001: Engineering Ethics (1 s.h.) and Industrial Engineering Graduate Seminar (ISE:5000) although the department may grant a waiver for Graduate Seminar during the first semester of enrollment for those students taking Engineering Ethics.

Semester 2

The student should meet with their academic advisor during the first two weeks of the semester. The student again registers for 6-9 s.h. of coursework and 0-6 s.h. of research, and monitors progress toward fulfilling the degree objectives alongside the advisor. During this semester, students will register for the Industrial Engineering Graduate Seminar (ISE:5000). Summer registration is not required for the non-thesis master's student, and securing of internships or external research opportunities is highly encouraged.

Semester 3

Students may register for 3-9 s.h. of coursework and 3-9 s.h. of research during the third semester with the approval of their academic advisor. Check ISE seminar requirements starting second year of study in section V of this handbook.

Semester 4 (Optional)

Students may register for 6-9 s.h. of coursework and 3-6 s.h. of research during an optional fourth semester with the approval of their academic advisor. Failure to complete an M.S. thesis degree within four semesters may constitute failure to meet normal progress, depending on the advisor's discretion. By the end of fourth semester the student will have completed 30 s.h. of coursework. Check ISE seminar requirements starting second year of study in section V of this handbook.

4. Undergraduate-to-Graduate (U2G) Degree Program

The undergraduate-to-graduate (U2G) program, formerly known as the BS/MS program, allows current undergraduate students to pursue the M.S. degree in industrial engineering with one additional year of study. This section applies to both University of Iowa U2G students and to participants in dual institution U2G programs.

Semester BS6 (6th semester of traditional 8 semester B.S.E. degree, or junior year, spring)

Students meet with their academic advisor and complete a U2G plan (Iowa students only) and submit an application to the Graduate College (Iowa students only). For University of Iowa students, GRE scores are not required. Students continue to follow the ISE curriculum as planned with their advisor.

Semester BS7 (7th semester of traditional 8 semester B.S.E. degree, or senior year, fall)

Students begin to take up to 4 cross-credited classes (12 s.h.) for B.S.E. and M.S. degrees.

Semester BS8 (8th semester of traditional 8 semester degree, or senior spring)

Students continue taking up to 4 cross-credited classes (12 s.h.) for the B.S.E. and M.S. degrees. Students complete degree requirements for the B.S.E. degree during this semester.

Grad Semester 1 (*1st semester of 2 semester graduate program*)

Students register for 9 s.h. of coursework and 3 s.h. of research. During this semester, the student will choose an advisor or have one assigned. The student will also form the thesis examination committee (See Section 4.B) and will maintain an appropriate program GPA level. Students are also expected to register for ENGR: 7270:0001: Engineering Ethics (1 s.h.) during their first semester of the graduate year of study and the Industrial Engineering Graduate Seminar (ISE:5000), although the latter course may be waived with permission from the department for students enrolled in Engineering Ethics.

Grad Semester 2 (2nd semester of 2 semester graduate program, final semester)

Students will register for 0 s.h. of coursework and 6 s.h. of research hours. Students also register for Industrial Engineering Graduate Seminar (ISE:5000). The student is expected to defend the thesis during this semester before the examining committee and is expected to maintain an appropriate program GPA.

5. Ph.D. Program

The guidelines for "normal progress" for Ph.D. candidates are listed below. Ph.D.-bound students without a prior M.S. degree typically enter the program as M.S. students and become Ph.D. students after completing the qualifying requirements.

Semester 1

Before being assigned to or selecting a research advisor, the student is advised by the Director of Graduate Studies (DGS). For students entering *with* an M.S. in industrial or systems engineering, with the advice and consent of the DGS, each student registers for 3-12 s.h. of coursework and 3-9 s.h. of research (for a minimum of 12 s.h.). The student meets with potential permanent advisors. After several weeks, a permanent advisor is assigned. For students entering *without* an M.S. in industrial or systems engineering, with the advice and consent of the DGS, each student registers for 6-9 s.h. of coursework and 3-6 s.h. of research (for a minimum of 12 s.h.) During this semester, students will also register for ENGR: 7270:0001: Engineering Ethics (1 s.h.) and ISE:5000: Industrial Engineering Graduate Seminar (1 s.h.) although the department may grant a waiver for Graduate Seminar during the first semester of enrollment for those students taking Engineering Ethics.

Semester 2

During Semester 2, Ph.D. students *with* an M.S. will register for 0-12 s.h. of coursework and 3-9 s.h. of research (for a minimum of 12 s.h.). Ph.D. students *with* an M.S. will meet the qualifying requirement during Semester 2. Students who already hold an M.S. degree will form their examining committee during this semester as well. Students *without* an M.S. will register for 6-9 s.h. of coursework and 3-9 s.h. of research (for a minimum of 12). Students who have not obtained their M.S. degree prior to beginning the program will either defend their M.S. thesis or choose the *en passant* option, as described in Section 5.D. During this semester, students will again register for the Industrial Engineering Graduate Seminar (ISE:5000).

Semesters 3-6

Semesters 3-6 are devoted to completing all core course requirements, the qualifying requirement, and preliminary research. For students entering *with* an M.S. in industrial or systems engineering, the comprehensive requirement should be met during or before the 4rd semester. For students entering *without* an M.S. in industrial or systems engineering, the comprehensive requirement should be met during or before the 6th semester. Check ISE seminar requirements starting second year of study in section V of this handbook.

Failure to meet these timelines may constitute failure to make normal progress.

Semester 3

Students who entered the program *with* an M.S. degree will register for 0-12 s.h. of coursework and 0-12 s.h. of research with the approval of their advisor. Students who entered the program *without* an M.S. degree will register for 6-9 s.h. of coursework and 3-9 s.h. of research (for a minimum of 12 s.h.). Ph.D. students *with*out an M.S. will meet the qualifying requirement during Semester 3. Check ISE seminar requirements starting second year of study in section V of this handbook.

Semester 4

Students who entered the program *with* an M.S. degree will register for 0-12 s.h. of coursework and 0-12 s.h. of research with the approval of their advisor. Students who already hold an M.S. degree will take the comprehensive exam during Semester 4. Students who entered the program *without* an M.S. degree will register for 3-12 s.h. of coursework and 3-9 s.h. of research during Semester 4 (for a minimum of 12 s.h.) with the approval of their advisor. Check ISE seminar requirements starting second year of study in section V of this handbook.

Semester 5

Students who entered the program *with* an M.S. degree will register for 0-12 s.h. of coursework and 0-12 s.h. of research with the approval of their advisor. Students who entered the program *without* an M.S. degree will register for 0-12 s.h. of coursework and 3-9 s.h. of research (for a minimum of 12 s.h.) with the approval of their advisor. Check ISE seminar requirements starting second year of study in section V of this handbook.

Semester 6

Students *with* an M.S. will defend their dissertation during Semester 6 (with a total of 72 s.h. including 30 s.h. from the M.S.). Students who entered the program *without* an M.S. degree will register for 0-12 s.h. of coursework and 0-9 s.h. of research with the approval of their advisor, and will take the comprehensive exam during Semester 6. Check ISE seminar requirements starting second year of study in section V of this handbook.

Semester 7

Students who entered the program *without* an M.S. degree will register for 0-12 s.h. of coursework and 0-9 s.h. of research with the approval of their advisor. It is expected that this semester will only be necessary for those students who entered the program *without* an M.S. degree in hand. Check ISE seminar requirements starting second year of study in section V of this handbook.

Semester 8

Students who entered the program *without* an M.S. degree will register for 0-12 s.h. of coursework and 0-9 s.h. of research with the approval of their advisor. It is expected that this semester will only be necessary for those students who entered the program *without* an M.S. degree in hand. Students *without* an M.S. will defend their dissertation during Semester 8 (with a total of 72 s.h. including 36 s.h. of coursework and 36 s.h. of research). Check ISE seminar requirements starting second year of study in section V of this handbook.

6. Part Time Ph.D. Program

Students who wish to pursue a Ph.D. degree on a part time basis will be expected to have already obtained an M.S. degree in industrial engineering or a related field before beginning the Ph.D. program. In order to maintain “normal progress” and “good standing” under this designation, students will register for a combined 6 s.h. of coursework and research. Students are expected to meet the qualifying requirement at the beginning of Semester 5 and take the comprehensive exam during Semester 7. Part time students will be expected to have graduated within 6 years (12 semesters) in order to maintain normal progress, meaning the final examination should be complete by the end of the 12th semester of continuous registration. See Section XII, Appendix B. Expected Degree Progress.

Final Semester for All Graduate Students In every student’s final semester, the student should meet all of the requirements laid out in the plan of study and adhere to all of the rules of the Graduate College. The student should meet all residency and dissertation requirements as stipulated by the Graduate College and the Department of Industrial and Systems Engineering. The student must pass the final examination. Students are also expected to complete the graduation checklist before leaving campus (see Section 5.G for more detail). Failure to complete the graduation checklist may result in withholding the final degree.

7. Academic Standing, Probation, and Dismissal

A student on regular status shall be placed on academic probation if, after completing 9 semester hours of graded (A, B, C, D, F) graduate work at The University of Iowa, the student is not meeting expectations. Meeting expectations includes the following 4 criteria: 1) good standing within the Graduate College; 2) satisfactory performance; 3) normal progress; and 4) appropriate professional conduct. Satisfactory performance within the department includes maintaining a program GPA of at least 3.25 for M.S. students and 3.50 for Ph.D. students.

Students who are on probation will receive written notification at the end of the semester in which they are placed on probation. This notification will include remedial actions required and a timeline for returning to good standing. The letter will be sent to the student's academic and research advisors as well as to the Graduate College. Students who fail to meet these remedial actions within the specified timeline will not be permitted to re-register for courses or graduation.

VIII. Additional Student Expectations

The following sections describe departmental expectations for graduate students in areas of scholarship, service, and teaching. These expectations may be reflected in annual evaluations and other elements of student feedback.

A. *Appropriate Professional Conduct*

As engineers, we are expected to act in a responsible and professional manner and to participate in departmental or other professional activities. Relevant standards include the course materials in Department, College and University ethics classes and trainings, departmental expectations of academic honesty (see Academic Misconduct – Section VIII.D), the Code of Student Life, University Operations Manual, and the Engineering Code of Ethics of the Institute of Industrial and Systems Engineers (see Appendix A). Alleged violations of this provision will be investigated by department faculty. If a violation of professional conduct is substantiated, then the department faculty will determine any punitive or corrective action at a closed session of a departmental faculty meeting.

B. *Scholarly Record Keeping*

1. Laboratory Notebooks

Students must maintain laboratory notebooks, or equivalent records, using best practices appropriate to their discipline. Any laboratory-specific or advisor-specific record keeping norms or policies must be adhered to.

2. Electronic Research Notes

Electronic records of research (instrument output files, computer codes, analysis scripts, electronic lab notebook systems) should be maintained according to laboratory-specific record keeping norms, advisor recommendations, and grant/contract data management plans. Data management plans typically specify backup procedures and frequencies, file formats, quality assurance procedures, storage location and indexing procedures, and rules or restrictions for access.

3. Computers

Computers that store research data, publication files, University of Iowa email, etc. need to be managed appropriately, whether they are (a) maintained by the College or University, (b) owned and maintained by the laboratory group, or (c) personal computers

such as laptops. Files and devices should be appropriately secured and backed up. The department encourages lab groups to develop group- and project-specific policies in conjunction with college and university IT staff.

C. *General Participation and Service Requirements*

Each Ph.D. or “M.S. with thesis” student meeting expectations, regardless of source of support, is required to participate regularly in the research, teaching, and service activities of the department as an integral part of their graduate training. Graduate students will be asked occasionally to assist the department in hosting visitors (e.g., prospective students, professional visitors, speakers, University leaders, funding agency program managers, advisory board members, etc.) and in holding special events (e.g., research symposia, open houses, outreach/education events, departmental gatherings, and awards programs). Participation provides excellent opportunities for students to develop skills in both formal and informal presentations.

D. *Academic Misconduct*

In dealing with issues of academic misconduct, the department follows the procedures as outlined in the Manual of Rules and Regulations of the Graduate College, which can be found at https://grad.uiowa.edu/academics/manual. For U2G courses that are for dual credit toward the B.S.E. and the M.S. degree, academic misconduct will be governed by College of Engineering rules and regulations. All graduate students should review the appropriate sections of the Manual of Rules and Regulations of the Graduate College. In summary, plagiarism, cheating, and other forms of academic misconduct are defined by the ISE faculty in accordance with norms appropriate for U.S. engineering programs. Sanctions for academic misconduct are to be determined by the ISE faculty, and can range from receiving an F on an assignment to dismissal from the department, which triggers simultaneous dismissal from the Graduate College. Appeal of decisions should use the departmental grievance procedures described below. If the grievance cannot be settled at the departmental level, an appeal should be made to the College of Engineering (U2G classes for dual credit) or to the Graduate College (all other classes).

The following policies apply to all courses but may be superseded by specific information in each syllabus. Faculty are encouraged to specify sanctions for cheating and plagiarism in syllabi but are not required to do so.

Exams: In cases of cheating on hourly or final exams, it is recommended that the instructor reduce the student’s grade to the grade of "F" in the course. When a course grade has been reduced to an "F", the student may not drop the course. Second grade option is not permitted for any graduate courses, meaning the F will remain on the transcript. It is recommended that cheating on quizzes be considered as serious a violation as on exams and that the penalty be similar. The instructor shall send a written report of any disciplinary action to the Office of the Dean of the Graduate College and the report shall be placed in the student's record.

Plagiarism: For a first offense of plagiarism on reports and literature reviews worth 15% or less of the total course grade, a zero on the assignment and a written report of the disciplinary action to the Office of the Dean of the Graduate College and the student file is recommended. For a first offense of plagiarism on reports and literature reviews worth more than 15% of the total course grade, an F in the course and a written report of the disciplinary action to the Office of the Dean of the Graduate College and the student file is recommended. For any second offense of plagiarism, dismissal from the department is recommended. The two offenses may be in different courses or different semesters.

Homework, Lab Reports, etc.: Each instructor shall announce and distribute in writing, at the beginning of each course, the acceptable policies on student collaboration in each of the graded course requirements. When the policy is clearly violated, a zero shall be assigned for the total portion of the course grade allocated to the requirement in which the violation occurred (e.g., a zero for all homework assignments if cheating occurred on a homework assignment). A written report of this action shall be sent by the instructor to the Office of the Dean of the Graduate College and placed in the student's record.

IX. Additional Considerations Regarding Graduate Education

A. *Additional Support Resources*

Beyond the resources of the Department, College of Engineering, and the Graduate College, there are considerable support systems at the University of Iowa to assist students, especially in times of stress or crisis. As of August 2019, a master list of resources can be accessed at: https://dos.uiowa.edu/assistance/quick-guide-for-helping-students/master-resource-list/

Key contact information is:

- Emergency 911, or 319-335-5022 (University of Iowa Public Safety)
- If you're not sure where to start, call Student Care and Assistance at the Office of the Dean of Students, 319-335-1162, DOS-Assistance@uiowa.edu
- The resources available as of 2019 include the Threat Assessment & Care Team, University Counseling Service, Student Health & Wellness, Sexual Misconduct Response Coordinator, Women's Resource and Action Center, Rape Victim Advocacy Program, Office of the Ombudsperson, Domestic Violence Intervention Program, Graduate College, Student Legal Services, International Student and Scholar Services, Student Disability Services, Office of Equal Opportunity and Diversity, Associate of Campus Ministers, Johnson County Crisis Center 24-hour Hotline, UI Health Care 24-hour Nurseline, and National Suicide Prevention 24-hour Lifeline. Consult a web search engine to find phone numbers and office locations. Many of these offer confidential and/or 24-hour support.

B. *Changing Advisors*

A change in advisor-student relationship may be requested by either the student or the faculty member. Changing this relationship, while possible, may create numerous difficulties for the student as well as for the advisor. The department may be unable to provide alternative financial support for students previously supported by their academic advisor or unable to find another faculty member willing to act as their academic advisor. In addition, the faculty member may be unable to fulfill his or her research obligations. As a result, changes in advisor are not taken lightly and cannot be automatically approved.

Should a difficulty arise in the advisor-student relationship which cannot be resolved privately, the Director of Graduate Studies and the DEO may be able to assist the parties in reaching a mutually acceptable agreement. If the problem cannot be resolved after consultation with the Director of Graduate Studies and the DEO, then a change of advisor may be formally requested by one or both parties. A change of advisor must be approved by the student, the student's advisor and the DEO. In the event that either the student or the former advisor refuses approval, a departmental faculty meeting will be held to discuss the change. The approval of the

department faculty is required before the change of advisor is approved. In either case, the student can petition the department (by writing a letter to the DEO requesting to present their case at the departmental faculty meeting).

A change of advisor may be permitted only when the following conditions have been met:

- A change in advisor is in the best interests of the student, the academic advisor, and the department.
- The Department Executive Officer has been consulted.

Generally, a change of advisor will require the student to change research projects.

A change of advisor will generally not be permitted if an M.S. candidate has less than one full semester remaining in his or her program. Typically, a Ph.D. candidate must have at least three full semesters remaining before completing degree requirements.

The student and/or academic advisor should submit his/her request for change of advisor in writing to the DEO, stating their reasons for the request. The DEO will bring this request to the department faculty for approval before granting the request.

C. *Intellectual Property*

1. Academic Freedom

The freedom to express new and divergent ideas and to challenge existing "truths" is essential to the vitality of the University. Consistent with this principle, the department encourages students to propose new theories and techniques in the course of their research. Furthermore, students are encouraged to express their ideas in a responsible and scholarly fashion.

It is not an infringement of a student's academic freedom to have the purposes, methods, results and conclusions expressed in the thesis or dissertation challenged for their scholarly merit or to demand that they meet the scrutiny of intense examination and the generally accepted standards of the academic community. In addition, the acceptance of the thesis as meeting the requirements for the degree is solely the function of the examining committee and the Graduate College and academic freedom is not at issue during the final examination.

2. Copyright

University regulations state that the M.S. Thesis or Ph.D. Dissertation is the property of the student and may be copyrighted by the student. It should be noted that a copyright does not imply ownership of the ideas, theories, methods, or conclusions expressed in the thesis or dissertation by the author. Rather, a copyright merely protects the specific form of the expression (i.e., the document itself). The student has the right to copyright his/her thesis or dissertation and can do so by following the procedures established by the Graduate College.

Furthermore, although the written document is the intellectual property of the student, and while novel ideas, concepts, theories, methods, results, and conclusions may also be the student's property, it can also be the property of persons other than the student. In such cases, these ideas, concepts, theories, methods, results and conclusions are the intellectual property of the person(s) who first conceived them. The student must comply with the requests and demands of the owner(s) of the intellectual property contained in their thesis or dissertation unless the intellectual property in question is available in the public domain. This provision is not intended to prevent the full publication of the thesis or dissertation.

3. Intellectual Property and Patent Rights

Except as provided for in the following paragraphs, textbooks and other products of teaching, research, scholarship, and artistic endeavors belong to the faculty or staff member (graduate student) when the product is not the result of a specific assignment or commission and where there is not substantial University contribution or support beyond the salary, developmental assignment, services, and facilities (including libraries and laboratories) customarily provided to faculty (or graduate students) in the respective discipline and University unit.

The University has an interest in and reserves the right to review, negotiate, and sign agreements for the use or sale, outside the immediate instructional setting, of the following educational materials: (1) Materials specifically commissioned by the University; (2) Materials to which the University has made a substantial contribution (one that is significant in the context of the situation and the practices in particular disciplines, schools, departments, or other units of the University); and (3) Materials developed with the assistance of outside funding where terms of the grant or contract are binding on the author or the University.

Rights in inventions are administered by the University Patent Committee and the University of Iowa Research Foundation pursuant to the official University Patent Policy adopted by the Board of Regents and set forth in the University Operations Manual. Questions regarding these policies should be addressed to the Office of the Vice-President of Research.

D. *Student Complaints Concerning Faculty Actions*

Informal. Students with complaints against faculty must first attempt to resolve the issue with the faculty member against whom there is a complaint. Lacking a satisfactory outcome, the student should discuss the matter with the Director of Graduate Studies and/or the DEO.

Students who are uncomfortable with dealing directly with a faculty member, DGS and/or DEO may seek assistance from the Ombudsman in the College of Engineering in seeking a resolution of the complaint. However, it is anticipated that grievances can be satisfactorily resolved most expeditiously at the faculty, DGS or DEO level. If the student is not satisfied with the outcome of this procedure, then the student should discuss the complaint with the Dean of the Graduate College.

As with any complaint procedure, all reasonable actions will be taken to prevent any retribution against the student(s) initiating the complaint, and any witnesses. This will include, if necessary, accelerated consideration of a change in academic advisor.

Formal. Students may submit a formal appeal to a faculty action by submitting a complaint in writing to the DEO. If the complaint is specifically related to the DEO, the complaint may be submitted to the Dean of the College of Engineering. The statement should clearly and completely state the allegation(s), including times, places, and individuals concerned, and must be signed and dated by the complainant. The information provided should form the basis for a thorough investigation of the allegation(s). The statement should also contain a preferred remedy. The recipient of the appeal (DEO or Dean) shall investigate and respond in writing within 10 working days. The recipient may in the course of their investigation and deliberation bring the matter before a faculty meeting, or they may form an inquiry committee of faculty and/or peers. However, these are not required. If the decision is rendered without consideration at a faculty meeting, the student may further appeal and require the decision to be reconsidered at a faculty meeting. Should this formal procedure fail to resolve the issue, the student is encouraged to contact the Graduate College or the University Ombudsperson where additional informal and formal dispute resolution options may be available. Relevant policy sections include the Manual of Rules and Regulations of the Graduate College, as well as the Academic Grievance Procedure of the Graduate College.

X. Departmental Policies

A. *Smoking Policy*

Smoking is prohibited in all University owned buildings, University owned or leased vehicles, and on all University grounds. This includes recreational facilities, athletic facilities, parking lots, and enclosed parking facilities.

B. *Student Workspace*

Each semester the DEO will assign office and laboratory space to graduate students. Priority for office and laboratory space will be given to students performing thesis/dissertation research, to teaching assistantships who must meet with students, and full-time graduate students. Due to space limitations, office space cannot be guaranteed to all graduate students.

Shared graduate student workspace, in a “hot desk” or “hoteling” model, will be offered to students in 4624 Seamans Center. Nine computational workstations are available for student use on a first-come, first-serve basis. Students may use the space no more than 4 hours per day during regular business hours. Lockable file cabinets for storage may be checked out one semester at a time; see the department administrator for details.

C. *Keys and Departmental Security*

Keys (or electronic access) to student offices, laboratories, common areas and entrances may be obtained from the department administrator. Students will only be issued keys to spaces for which they are specifically authorized. The keys must be returned when requested by the department or when the student no longer requires access. In any case, all keys issued to the student must be returned when all degree requirements are completed.

Each student and faculty member is responsible for all keys issued to him/her. The student must leave a deposit for each key, which will be reimbursed when the key(s) are returned.

Since departmental security depends on key control, it is necessary to re-key all affected locks and issue new keys when a key is lost, stolen or not returned. This is a very expensive process costing up to several hundred dollars for some locks. Do not lend your keys out or leave them unattended. Return keys you no longer need as soon as possible. Graduation applications, registration and other paperwork may be canceled for failure to pay outstanding bills to the department.

The theft of laboratory and personal items is common. Do not keep valuables in your desk. Keep your keys with you at all times. Lock your doors and windows when leaving your laboratory. Do not block open locked doors. Do not let unauthorized persons into the building after hours. Anyone who belongs in the building after hours should have a key.

D. ***Computing***

As a graduate student in the department, you also have access to all ECS (Engineering Computer Services) resources. Students must use computing resources ethically and legally. It is a violation of University policy to access, read, copy or use the computer programs, files, tapes, or other material without the knowledge and consent of the owner. Violation of this policy is considered the equivalent of theft. In addition, students must observe the copyright protection afforded commercial software and are not permitted to make illegal (or "bootleg") copies of copyrighted software. Access to super computers, parallel processors and other high-speed computing resources is available. Your academic advisor or the DEO can assist you in obtaining time on these machines.

E. ***Shops***

There are a number of shops on campus available to repair and construct graduate research apparatuses. These shops charge users for labor and materials. A university requisition is required prior to obtaining services. Please work closely with your advisor to select facilities for construction and repair of apparatuses.

F. ***Purchasing Supplies and Services***

Purchasing procedures differ depending on where the item or service is being purchased from. Please check with the Departmental Administrator prior to purchasing goods, or services, including travel tickets, hotel reservations, and conference registrations.

Major equipment costing more than $5,000 should be submitted to University Shared Services for review and potential bids. This process can be time consuming and usually takes several months to complete. Students should plan their research accordingly.

For routine lab supply purchases that are authorized by the research advisor, send an e-mail, quote, or eBuy cart to University Shared Services (uss-engineering@uiowa.edu or Shared Services for your lab). Make sure to include the vendor, item number, item name/description, price, and quantity. Shipping will be standard delivery unless you note a need for expedited delivery.

College of Engineering Shared Services Contacts: https://uiowa.edu/university-shared-services/uss-contacts-college-engineering

G. *Library*

The Engineering Library should be considered a valuable asset to graduate researchers. The Engineering library and other libraries on campus have valuable short courses on searching literature and databases, citation and reference management, and data management. Researchers are encouraged to meet with Engineering Library staff to discuss their research and discover relevant resources.

The University of Iowa has a decentralized library system. Most of the industrial and systems engineering literature is accessible on the web. Engineering and some industrial engineering literature is housed in the Engineering Library (2100 SC). Loan policies vary by library; however, graduate students typically may check out books for one semester. All materials are subject to recall.

H. *Secretarial Assistance/Copy Machine/Laser Printer*

Secretarial assistance is limited to that needed to discharge the responsibilities of an assistantship or other appointment. T.A.s are encouraged to type their own lecture material using a personal computer. Personal typing such as thesis, class material, homework, etc. is the responsibility of the student. Use of the department copy machine is limited to that needed to discharge the responsibilities of a teaching or research assistantship.

I. *Use of Teaching Equipment for Graduate Research*

In general, it is the policy of this department that equipment of the instructional laboratories may not be used for graduate study. Limited, short-term, or occasional use for graduate research may be approved by the Director of Undergraduate Studies or the DEO. The equipment must remain in the instructional laboratory, and such usage must not interfere with the instructional use of the equipment. The research advisor must certify in writing that use of the equipment is essential to the research project and that the advisor and student will be responsible for repairing any damage to the instruments that arise from their use. The research advisor must also agree to pay for supplies and incidental items used by their students while using instructional equipment. This is necessary to cover the cost of such items as paper, pens, syringes, cuvettes, reagents, etc. The users must be trained to use the equipment properly and safely. Any equipment problems must be reported immediately to the Director of Undergraduate Studies or the DEO. Arrangements for repairs due to damage or wear from non-instructional use must be made immediately from non-departmental funds. For use of the instruments after hours, room access may be granted with the permission of the Director of Undergraduate Studies or DEO. Any violation of these policies may result in the loss of instructional equipment use privileges.

In extraordinary circumstances, instructional equipment may be loaned to academic advisors for research purposes for a limited time (typically four weeks or less). A written request must be submitted to the Director of Undergraduate Studies or DEO. Approval will

be granted only if undergraduate teaching will not be impaired and the academic advisor has taken steps to purchase the needed equipment. In no case will teaching equipment be loaned for more than one semester.

J. *Safety and Hazardous Materials*

All chemicals in the laboratory should be considered potentially hazardous. Safety Data Sheets (SDS) are available online for most of the chemicals used in your laboratory. The SDS contains information regarding the potential chemical, physiological, mechanical and other hazards associated with the chemical. Check with your academic advisor, the department office or the Environmental Health and Safety Office in order to see the SDS of interest to you. Laboratory instructors are responsible for providing SDS on all chemicals used in the course to the graduate T.A.s. The T.A.s are then responsible for making them available to the laboratory students before they start the lab.

Each experimental laboratory must have at least one person designated and trained to dispose of hazardous waste.

The supervising faculty member of each laboratory is responsible for initial and annual training of all students and staff working in the lab. Typical training requires online training in Chemical Safety for Labs, Safety Procedures for UI, PPE (Personal Protective Equipment) Awareness for Labs, Hazardous Material Preparedness and Spill Response, Biohazardous Waste, and lab specific training in the Chemical Hygiene Plan / Lab Chemical Safety, which covers access to MSDS sheets, training and standard operating procedural requirements for the specific lab, evacuation routes, and PPE requirements for the lab. Initial and annual training, such as in compressed gasses, laser safety, blood borne pathogens, ionizing radiation, or other topics may be appropriate.

Please see a senior member of the lab or faculty member if you are unsure of a safe procedure, or of the training and training documentation requirements for your research.

XI. Emergency Procedures

Please consult lab specific safety policies/procedures and the University of Iowa appropriate procedures and policies, such as the University Laboratory Chemical Hygiene Plan.

To summarize, in the event of fire or chemical hazard, you should leave the building and call for help. Fire extinguishers, fire alarms, eyewash fountains and emergency showers are in all laboratory areas. Note the location of these devices near your office or laboratory.

For all emergency situations where immediate assistance is required (major chemical spill, serious injury, police, fire or ambulance) call 911.

For other emergencies call Public Safety (319-335-5022), e.g. break-Ins or illegal entry to labs, personal injuries, theft, or other crimes.

For building emergencies call Facilities Maintenance Work Control Center (319-335-5071) and departmental or building administrators. After working hours, call the Facility Services Group emergency number, 319-335-5063, or Public Safety, 319-335-5022. Examples of building emergencies include loss of electricity, lack of fume hood ventilation, leak in gas, steam or water lines, elevator problems, heating/AC problems, storm damage, and snow removal.

In emergency calls, state your location, the nature of the problem, and the assistance you are requesting. Finally, you should report all problems and emergency situations to your academic advisor and to the DEO as soon as possible.

If you are injured while at the University, it is important to get proper medical treatment and to alert your supervisor of the injury. You may be provided no-cost treatment at a University-approved clinic, and you will likely be asked to participate in an accident investigation to help prevent accident reoccurrence.

Your supervisor must file a First Report of Injury within 24 hours of the incident, following the chapter on Accidents in the University Operations Manual. The form is available through HR Employee Self-Service. Contact Environmental Health & Safety for assistance if needed.

XII. Appendices

A. *Appendix A – Code of Ethics*

The University of Iowa Department of Industrial and Systems Engineering follows the same codes and ethics as our guiding professional organization, the Institute of Industrial and Systems Engineers (IISE) in adhering to the Canon of Ethics as provided by the Accreditation Board for Engineering and Technology (ABET).

The Fundamental Principles

Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

1. Using their knowledge and skill for the enhancement of human welfare;
2. Being honest and impartial, and serving with fidelity the public, their employers and clients;
3. Striving to increase the competence and prestige of the engineering profession; and
4. Supporting the professional and technical societies of their disciplines.

The Fundamental Canons

1. Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
2. Engineers shall perform services only in the areas of their competence.
3. Engineers shall issue public statements only in an objective and truthful manner.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.
5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
6. Engineers shall associate only with reputable persons or organizations.
7. Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional development of those engineers under their supervision.

Please visit the Accreditation Board for Engineering and Technology (ABET) site to learn more about the Code of Ethics and the accreditation process.

B. ***Expected Degree Progress***

Degree	Sem 1	Sem 2	Sem 3	Sem 4	Total
MS Non-Thesis	12-15 CW Ethics & Sem	12-15 CW Sem	(Optional) 6-15 CW Sem		30 CW
MS Thesis	9-12 CW 0-3 RH Min 12 SH Ethics & Sem	3-12 CW 6-9 RH Min 12 SH Sem	(Optional) 0-9 CW 3-6 RH Sem	(Optional) 0-9 CW 3 RH Sem	21 CW 9 RH
U2G Non-Thesis	12 CW Ethics & Sem	12 CW Sem			18 CW (+12 SH from BSE)
U2G Thesis	6-12 CW 3 RH Ethics & Sem	3-9 CW 3-6 RH Sem	(Optional) 0-6 CW 3 RH Sem		9 CW 9 RH (+12 SH from BSE)
MS Non-Thesis w/ 50% RA/TA or part-time	6-9 CW Ethics & Sem	6-9 CW Sem	6-9 CW Sem	6-9 CW Sem	30 CW
MS Thesis w/ 50% RA/TA or part-time	6-9 CW 0-6 RH Ethics & Sem	6-9 CW 0-6 RH Sem	3-9 CW 3-9 RH Sem	(Optional) 0-9 CW 3-6 RH Sem	21 CW 9 RH
U2G Non-Thesis w/ 50% RA/TA or part-time	6-9 CW Ethics & Sem	6-9 CW Sem	6-9 CW Sem		18 CW (+12 SH from BSE)
U2G Thesis w/ 50% RA/TA or part-time	6-9 CW 0-6 RH Ethics & Sem	6-9 CW Sem	(Optional) 0-9 CW 0-3 RH Sem		9 CW 9 RH (+12 SH from BSE)

Degree	Sem 1	Sem 2	Sem 3	Sem 4	Sem 5	Sem 6	Sem 7	Sem 8	Total
Ph.D. with MS full time, or with TA or RA (Max 8 semesters, 6 typical)	3-12 CW 3-9 RH Min 12 SH Sem Ethics	0-12 CW 3-9 RH Min 12 SH Sem Qual	0-12 CW 0-12 RH Sem	0-12 CW 0-12 RH Sem Comp	0-12 CW 0-12 RH Sem	Sem Final Diss			72 SH (-30 SH from MS)
Ph.D. with MS part-time off campus (Max 10 semesters, 8 typical)	3-6 CW 0-6 RH Min 6 SH Sem Ethics	3-6 CW 0-6 RH Min 6 SH Sem Qual	0-6 CW 0-9 RH Min 6 SH Sem	0-6 CW 0-9 RH Min 6 SH Sem	0-6 CW 0-9 RH Sem	0-6 CW 0-9 RH Sem Comp	0-6 CW 0-9 RH Sem	0-6 CW 0-9 RH Final Diss	72 SH (-30 from MS degree)
Admitted directly to PhD with no MS, 50% RA/TA (Max 10 semesters, 8 typical)	6-9 CW 3-6 RH Min 12 SH Sem Ethics	6-9 CW 3-6 RH Min 12 SH Sem	6-9 CW 3-9 RH Min 12 SH Sem Thesis Qual	3-12 CW 3-9 RH Min 12 SH Sem	0-12 CW 3-9 RH Min 12 SH Sem	0-12 CW 0-9 RH Sem Comp	0-12 CW 0-9 RH Sem	0-12 CW 0-9 RH Sem Final Diss	36 CW 36 RH

Key: SH = Semester hours, CW = Coursework semester hours, RH = Research semester hours, Sem = ISE:5000 Graduate Seminar, Ethics = ENGR:7370 Engineering Ethics, Qual = Complete Qualifying Examination, Comp = Complete Comprehensive Examination, Final = Complete Final Examination, Diss = deposit a signed copy of the dissertation.

C. ISE Courses Approved for Graduate Credit and Focus Areas

*MS program requirements: 3 semester hours in each of the focus areas 3000-level or above
*PhD program requirement: 6 semester hours in each of the focus areas 5000-level or above

Course	Title/Name	Systems	Human Factors	Analytics
ISE:3300	Manufacturing Systems	X		
ISE:3350	Process Engineering	X		
ISE:3400	Human Factors		X	
ISE:3450	Ergonomics		X	
ISE:3500	Information Systems Design	X		
ISE:3600	Quality Control	X		
ISE:3610	Stochastic Modeling			X
ISE:3660	Data Analytics with R			X
ISE:3700	Operations Research			X
ISE:3750	Digital Systems Simulation	X		
ISE:4172	Big Data Analytics			X
ISE:4175	Safety Engineering		X	
ISE:4620	Design of Experiments for Quality Improvement	X		
ISE:4900	Introduction to Six Sigma	X		
ISE:5310	Advanced Computational Design and Manufacturing	X		
ISE:5420	Automated Vehicle Systems		X	
ISE:5460	User Experience Design		X	
ISE:5520	Renewable Energy	X		
ISE:5620	Design of Experiments	X		
ISE:5650	Mechatronics Engineering for Smart Device Design	X		
ISE:5730	Digital Industry			X
ISE:5740	Design and Analysis of Computer Experiments			X
ISE:6211	Human Factors in Healthcare Systems		X	
ISE:6220	Cognitive Engineering		X	
ISE:6300	Innovation Science and Studies			X
ISE:6350	Computational Intelligence	X		
ISE:6380	Deep Learning			X
ISE:6410	Research Methods in Human Factors Engineering		X	
ISE:6420	Human/Computer Interaction		X	
ISE:6450	Human Factors in Aviation		X	
ISE:6460	The Design of Virtual Environments		X	
ISE:6480	Unmanned Aircraft Systems		X	
ISE:6650	Human Analytics and Behavioral Operations			X
ISE:6760	Pattern Recognition for Financial Data			X
ISE:6780	Financial Engineering and Optimization			X
ISE:6790	Advanced Data Analytics and Informatics			X
ISE:6810	Advanced Topics on Additive Manufacturing	X		