

Northwestern | McCORMICK SCHOOL OF
ENGINEERING

Industrial Engineering and
Management Sciences

IEMS PhD Graduate Student Handbook

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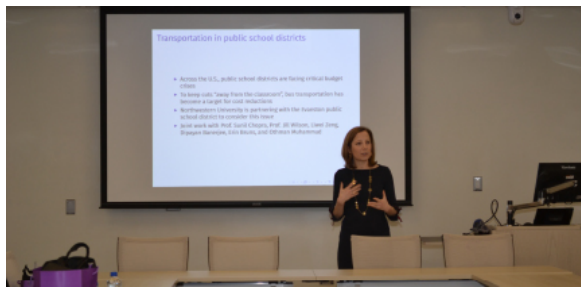
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Introduction

This handbook guides students through the requirements, procedures, and opportunities of study associated with the PhD program in Industrial Engineering & Management Sciences at Northwestern University. For the most part, the handbook deals with procedures of the IEMS Department and its PhD program. On matters concerning Graduate School or University policy, the [Graduate School's Academic Policies and Procedures](#) or the [Northwestern Student Handbook](#) should be consulted.

While the handbook provides the basic information necessary for successfully negotiating the requirements of the Program, it is not meant to serve as a substitute for our advisory system. Students are encouraged to schedule frequent meetings with their advisors to discuss their goals, options and plans, as well as progress in the Program.



Students are admitted to The Graduate School of Northwestern University in order to study in the Program. Students must follow all the procedures and guidelines established by The Graduate School for such matters as registration, receiving payment of stipends, ensuring full-time status in terms of graduate study, and meeting graduation deadlines. Staff within The Graduate School do their best to assist students in meeting requirements and deadlines. Do not ignore notices, requests or memos issued by The Graduate School (e.g. TGS E-News) to insure compliance with Graduate School procedures.

It is the students' responsibility to consult this handbook and seek out additional information so that they adhere to all required procedures, including those of the Program, Department, McCormick School of Engineering, Graduate School, and University. If there are questions or confusion, consult the Graduate Program Assistant for IEMS.

Degree Requirements

To receive the PhD in Industrial Engineering and Management Sciences, students must successfully complete the required coursework, candidacy, prospectus and dissertation defense exams, teaching requirements of The Graduate School, and McCormick Responsible Conduct of Research (RCR) training. Students also must complete all degree requirements within the IEMS Departmental timeline and submit all required forms prior to graduation. (For details on the candidacy, prospectus and dissertation defense exams, please see Degree Milestones.)

Required Coursework

To fulfill the following requirements, 15 one-credit courses must be taken for a letter grade (not taken P/NP).

IEMS PhD Core Courses (8)

- IEMS 401 Applied Mathematical Statistics
- IEMS 435 Introduction to Stochastic Simulation
- IEMS 450-1 Mathematical Optimization I
- IEMS 460-1 Stochastic Processes I
- IEMS 450-2 Mathematical Optimization II
- IEMS 460-2 Stochastic Processes II
- IEMS 488 Economics and Decision Analysis
- IEMS 490 Statistical Learning

Required Application Courses (2)

Two courses must be chosen from the following list

- IEMS 441 Social Networks
- IEMS 473 Financial Engineering
- IEMS 481 Logistics
- IEMS 482 Operations
- IEMS 485 Healthcare Engineering
- OPNS 521 Foundations of Operations Management
- OPNS 524 Empirical Methods in Operations Management

Major and Minors (5 Courses)

- Analytics (minor only)
- Stochastic Analysis and Simulation
- Optimization
- Financial Engineering
- Logistics and Operations
- Healthcare Engineering
- Applied Statistics and Statistical Learning
- Management Science

PhD students must complete a 3-course major and a 2-course minor. Courses that can be counted towards majors or minors are listed in the PhD Major and Minor Areas Document (Appendix A). Students may petition the Director of Graduate Studies to add courses to the list. Students also may petition to design a major or minor area of their design with approval from their advisor, the Director of Graduate Studies, and the Graduate Committee. Complete form (Appendix B) and return to Director of Graduate Studies. Students enrolled in the PhD program prior to Summer quarter 2021 are considered to operate under the earlier coursework requirements, but retain the option to opt into the new system as desired. Please email the Graduate Program Assistant if you wish to do so.

Waiving Required Courses

Students may request a waiver of the requirement that a course be taken for their PhD in IEMS, justified by graduate-level coursework previously done at another institution. A waiver of a required course does not reduce the total number of courses required for the degree. If a core course is waived, another course must be taken during the first year as a substitute for the waived core course. The substitution is subject to the approval of the Director of Graduate Studies and the Graduate Committee. The substitute course must be in the same subject area and at least as valuable in assessing first-year student achievement. Interested students should bring the Required Course Waiver Request Form (Appendix C) along with supporting documentation for previous graduate-level coursework, such as transcripts, syllabi, course descriptions, and reading lists, to the Director of Graduate Studies immediately after entering the program.

Teaching Requirements

TGS requires that all PhD students serve in some instructional capacity for at least one academic quarter during their graduate education at Northwestern University. This requirement is usually fulfilled by IEMS PhD students through service as a teaching assistant in an IEMS course. For details on IEMS expectations of teaching assistants, please review the IEMS Department responsibilities and expectations for teaching assistants (Appendix D).

English Proficiency: Please see <http://www.tgs.northwestern.edu/funding/assistantships/graduate-and-teaching.html> on The Graduate School's requirement regarding spoken English proficiency. International students should be sure to satisfy this requirement by the end of the first year in the program. Because spoken English proficiency is a TGS requirement to receive financial aid as a teaching assistant, the IEMS Department's guarantee of financial aid to an international PhD student is valid after the first year only if this spoken English proficiency requirement is satisfied.

Serving as the instructor for an IEMS course is another way to satisfy the TGS teaching requirement. Opportunities for PhD students to be instructor of an IEMS course are limited because the Department aims to appoint only students with proper talent and training as instructors. Students interested in the possibility of becoming instructors are encouraged to communicate their interest to the Director of Graduate Studies and to use the following procedure for demonstrating their qualifications to be instructors.

An interested PhD student asks for the opportunity to deliver a lecture in an IEMS course. Often, this is a course in which the student is currently serving as a teaching assistant, but it does not have to be. When such an arrangement is made, the instructor should provide teaching notes for the lecturing student, or review the lecturing student's notes in advance. The instructor, or another faculty member, attends the lecture or reviews a video of the lecture, and then writes an evaluation. The evaluation goes to the student, to the Director of Graduate Studies, and to the Graduate Program Assistant for inclusion in the student's file. The evaluation should summarize the strengths, weaknesses, and areas of potential improvement in the lecture, and include a rating on the following scale:



- A. Excellent job – teaching at this level would be very acceptable from regular IEMS faculty.
- B. Good job – some aspects were done very well, but there is room for improvement; teaching at this level would probably result in average student evaluations.
- C. Adequate job – there were some significant shortcomings; teaching at this level would probably result in relatively poor student evaluations.
- D. Poor job – there were serious problems; teaching at this level is unacceptable in IEMS classes and would probably result in very poor student evaluations.

Students are encouraged to discuss the evaluation with the Director of Graduate Studies, who can provide an assessment of the likelihood of an instructorship. The evaluation process can be repeated, which provides an opportunity to learn from the initial evaluation. The decision about appointing a PhD student as an instructor is made by the Department Chair, considering factors including the qualifications of the interested students and the Department's need for instructors.

Registration Requirements

PhD students who have not completed the Dissertation must maintain continuous registration during Fall, Winter, and Spring quarters (or else take a leave of absence). The Crown Internship satisfies the requirement of continuous registration. For more details, see TGS' Continuous Registration Policy ([TGS section 4.10](#))

Time Requirements

Students are expected to devote their full efforts to graduate study and complete the requirements for the PhD within 4-5 years. Students must be registered full-time except during a Summer quarter in which no funding is received. Full-time registration means 3-4 credits per quarter (including credits of IEMS 499 or IEMS 590 research) or registration in TGS 500, 512 or 513. Therefore a student who is funded as an RA for Summer quarter should register for research. A first year student who has not yet attained candidacy should enroll in credits of IEMS 499, while those students who have passed their candidacy exams should enroll in individual units of IEMS 590 or a quarter of TGS 500.

The Graduate School's [deadlines for completion of degree requirements](#) extend beyond those of the IEMS Program. According to Graduate School rules, students must complete all requirements for the PhD within 9 years. Because the IEMS Program accepts only full-time students, we expect students to complete the PhD within the guidelines outlined by our Program (see Degree Milestones for more information).

Graduation

When a student is ready to graduate at the end of a particular quarter, they should file an Application for Degree with The Graduate School online via the Graduate Student Tracking System. Graduation is held in June and December,



each year. As long as all the requirements for the PhD have been completed, students may participate in either the June or December ceremony. (Students should consult with their advisor as well as the Graduate Program Assistant before making their final decision.) The application deadline is usually about two months prior to graduation (Consult the TGS Academic Calendar for exact dates).

International Students should be aware of visa requirements if they intend to seek employment in the United States after graduation. Students with F-1 visas should consult information provided by the International Office about optional practical training ([OPT](#); see [International Office website](#)). It is important to plan ahead because it can take months for work

authorization to be processed.

Other Coursework and Activities

RCR Training

As part of the McCormick policy for Responsible Conduct of Research (RCR) Training, students must fulfill two requirements:

1. **Online Course:** Complete 9 modules of the online CITI course before the beginning of Fall quarter of the first year and obtain a passing grade of at least 80% on each module: To begin, see <https://www.citiprogram.org/>. Return certificate of completion to the Graduate Program Assistant before first day of Fall quarter.
2. **Complete McCormick Course GEN_ENG 519 before the end of the first year.**

Brown Bags and Seminar Speakers

The Department hosts a weekly research seminar. The brown-bag seminar series is designed for first-year students of the PhD program in the IEMS Department. It provides an opportunity for students to meet IEMS faculty members and learn about their research interests and current projects. This provides an opportunity to identify potential advisors and an orientation to the field of IEMS. Attendance is required for all first-year IEMS PhD students, even in the case that the speaker is not a potential advisor for the student.

Graduate Student Research Mixer

The Graduate Student Research Mixer is an opportunity for IEMS PhD students to present to their peers, in an informal setting, their current research in an effort to nurture collaboration between research groups.

INFORMS

Northwestern University has a student chapter of the nationally recognized INFORMS organization. The INFORMS student chapter arranges professional development and social events for students.



Internships

After their first year in the program, students may take on internships with outside organizations. Interning students do not receive funding from IEMS, but are supported by the internship instead. It is especially

common to do internships during Summer quarter if other funding is not available. Internships in a quarter other than Summer quarter may be possible, but are rarely appropriate. Students should consult their advisors before making internship arrangements. Students can find internships on their own, get advice from their advisors or the INFORMS student chapter, or visit the Co-Op & Internship Office in McCormick.

Crown Internship Registration: Students who are on full-time internships and not taking classes, should register for the [Crown Internship program](#). This is a non-credit course which allows students on internship to maintain their student status within the University. International students should be aware of visa requirements if they intend to seek employment in the United States **including internships**. Students with F-1 visas should consult information provided by the International Office about [Curricular Practical Training \(CPT\)](#). **It is important to allow adequate time for processing.**

Degree Milestones

Year One

Completion of Core Courses

PhD students spend about two-thirds of their first year of study taking a common core of eight IE courses. Additional first-year courses may be chosen from relevant graduate-level offerings throughout the University in such areas as computer science, statistics, mathematics, other areas of engineering, management, and the social sciences. First-year students should discuss their coursework with the Director of Graduate Studies (DGS).

Completion of RCR Course and Online Training

Candidacy Exam and Continuation in the PhD Program.

The candidacy exam is offered in June of each year. A student must take the exam at its first offering after they have had the opportunity to complete the eight PhD core courses. For most students, who begin in Fall quarter, the candidacy exam must be taken in June of their first year in the program.

Format of the Exams: The candidacy exam is a two-hour oral exam administered to individual students by committees of at least three IEMS faculty members. The exam is based on the student's review and presentation of one of a selection of papers provided by IEMS faculty. A student is also required to submit to their committee a short written report on the paper prior to the oral examination. Guidelines for the oral presentation and written report are communicated in advance. In the above, the phrase "IEMS faculty member" means any graduate faculty member with at least a 20% appointment in IEMS.

Evaluation of Candidacy Exam: Following the student's exam, committee members each confidentially submit a grade evaluation. This grade evaluation is incorporated into an evaluation of all first-year PhD students by the IEMS graduate faculty for the purpose of deciding continuation in the program. This evaluation is based on candidacy exam performance, performance in coursework, and faculty evaluation of research potential.

There are four possible outcomes of the evaluation after the candidacy exam:

1. **Invitation to continue in the PhD program:** This is the normal outcome.
2. **Invitation to continue in the PhD program, with conditions:** The student can continue temporarily in the PhD program, but will be dismissed from the program unless specified conditions are met. The conditions are determined as warranted by the individual student's unique record. Possible conditions include, but are not limited to, earning adequate grades in further courses, achieving a satisfactory performance in another candidacy examination, and passing the prospectus exam on an earlier timeline.
3. **Dismissal from the PhD program, eligible for MS degree:** The student is dismissed from the PhD program. However, the performance on the candidacy exam was sufficient to grant an MS degree once the other requirements for the MS degree are satisfied.

4. **Dismissal from the PhD program, ineligible for MS degree:** The student is dismissed from the PhD program and cannot receive the MS degree.

MS Degree Conferral

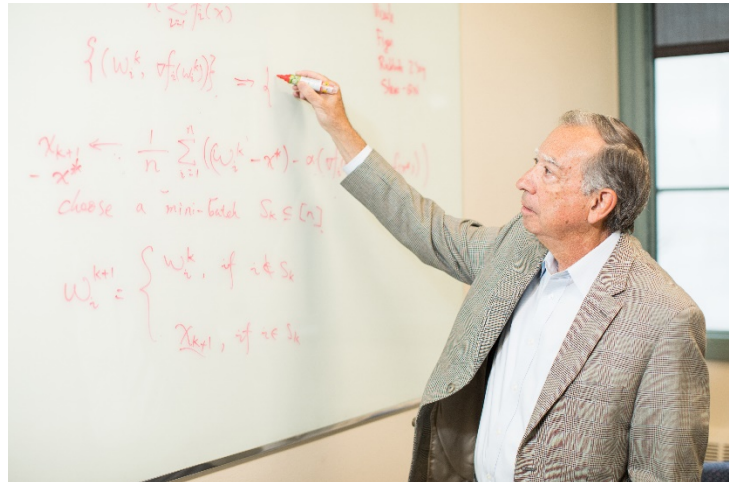
The requirements for the MS in IEMS are: 12 credits of graduate coursework taken for a letter grade (not P/ no P), including the 8 PhD Core courses, a GPA of at least 3.0, and a satisfactory performance on the PhD candidacy exam. An IEMS PhD student who has satisfied these requirements and wants to be awarded the MS degree must log into the Graduate Student Tracking System and fill out the Master's in Primary PhD form. Following approval of this form, applicants will subsequently submit the Application for Degree and Master's Degree Completion forms via GSTS. All three forms must be submitted in order to be awarded the degree.

The MS degree in Industrial Engineering and Management Sciences is only available for those students enrolled in the IEMS PhD program. There is no MS degree program to which applicants are admitted. The MS in IEMS is also not available to Northwestern University students who are not in the IEMS PhD program.

Year Two

Research, Advisor, and Committee

By the beginning of the second year, at latest, each student should have an advisor and begin research leading towards a dissertation. Students are free to change advisors, but must consult the Director of Graduate Studies before doing so. Students who fear that their current advising relationship is not helping them achieve satisfactory progress towards the dissertation should discuss their goals and progress with their advisors and consult the DGS if problems persist. Students are not required to have an advisor during year two, but it is inadvisable not to have one. Students are required to make satisfactory academic progress, and it is extremely unlikely that a student would make satisfactory progress without an advisor. Students are encouraged to form the prospectus committee by the end of the second year. They should seek guidance from all committee members and learn their expectations while research is in progress.



Year Three

Prospectus

Students present a prospectus once they have finished an initial part of their dissertation research and can present their ideas about the next steps. This must happen by the end of the third year. The prospectus exam requires a research document, an oral presentation and approval by a committee chosen by student and advisor.

Prospectus Committee: A student's Prospectus committee is chaired or co-chaired by the student's advisor. Two or more additional committee members are chosen by the advisor in consultation with the student. At least two committee members, including the chair or a co-chair, must be full or joint IEMS faculty. The committee must include at least one member who has primary affiliation outside the IEMS Department, who is often from outside the University as well.

Preparation Prior to Prospectus: The student must complete the following steps at least one week before the prospectus exam:

1. Log into the Graduate Student Tracking System, fill out the PhD Prospectus form in the TGS Forms tab, and notify the Graduate Program Assistant. The Graduate Program Assistant will verify that the committee meets the requirements stated above; if not, the committee will need to be changed before the exam can take place.
2. Notify all IEMS faculty and PhD students by email about the prospectus exam, which is open to any of them who wish to attend.
3. Send the written report to all committee members.

4. The student must complete the Course Verification form (Appendix E) and sign it, along with their advisor, and submit it to the Graduate Program Assistant. The purpose of this is to ensure that the student is on track to fulfill coursework requirements before graduation.

Prospectus Exam: There are three possible outcomes when the prospectus exam takes place:

1. Pass: With the unanimous agreement of the committee members, the student has satisfied the prospectus exam requirement.
2. Pass, with conditions: The committee members unanimously agree that the oral component of the prospectus exam was satisfactory. However, some or all of them require changes to the prospectus document before giving final approval. Once changes are made to the satisfaction of a committee member, they will notify the Graduate Program Assistant that all requirements have been met. Once unanimous support has been achieved, the student has satisfied the prospectus exam requirement.
3. Fail: At least one committee member declines to endorse the passage of the exam on the grounds that the student's performance was unsatisfactory. The student must do another prospectus exam to satisfy the prospectus exam requirement.

The Graduate Program Assistant will reach out to each of the committee members after the exam has been completed to assess the student's performance.

A student who did not pass the prospectus exam can schedule another prospectus exam, in consultation with the advisor. There is no penalty for failing a prospectus exam. There is only the requirement to pass a prospectus exam by the end of the third year. If this is not done, the student will be placed on academic probation, as described [here](#), which will result in eventual dismissal if the prospectus exam is not passed. So as to leave time for changes to the prospectus document or a second prospectus exam, the prospectus exam should be scheduled well before the end of the third year.



In case of failing the prospectus exam if the student and advisor disagree with the judgment of a committee member, if need be, they can change the composition of the committee for the next prospectus exam. If the student disagrees with the advisor's judgment that the student failed the exam, and cannot resolve the situation through mutual discussion, the student should discuss the situation and a possible change of advisor with the DGS.

Electronic Participation and Approval: Committee members are allowed to participate electronically if they cannot be present physically at the exam. These methods include but are not limited to: conference call, webcam conferencing, video conferencing. The Department can supply a phone used for conference calls. All other methods of electronic participation are the student's responsibility to provide and set up. If a committee member is not present to sign an exam form, they can sign the exam form and return to the student electronically.

Year Four and Beyond

Dissertation Defense

The dissertation is normally completed and defended during the fourth or fifth year. It must be defended at least 3 quarters after the prospectus exam. The procedures and rules governing the dissertation defense are the same as those for the prospectus exam, with the following differences:

1. Instead of the research document for the prospectus exam, there is the dissertation.
2. The IEMS deadline for passing the prospectus exam is not relevant; instead, the TGS deadline of 9 years for completing the PhD applies.

The dissertation committee is chosen in the same way as the prospectus committee and does not have to be the same as the prospectus committee.

Final Copy of the Dissertation: Once the committee approves the Dissertation (including any necessary edits and changes) and the Oral Defense, the Final Copy of the Thesis/Dissertation is submitted on-line via

the ProQuest system. Once the dissertation has been approved by its committee and all edits and revisions are complete, the student must submit an electronic version of the paper online via UMI/ProQuest. See [this page](#) for information on formatting guidelines and copyright laws and regulations.

Notification of Academic Progress

Review

Satisfactory academic progress is assessed in two ways: completion of milestones by deadlines, and satisfactory research progress based on advisor's evaluation. The milestones of candidacy, prospectus, and defense exams were described above. The advisor's evaluation of research progress takes two forms: annual review and timely notification of unsatisfactory progress.

Requirement to Have an Advisor

Beyond year two, every PhD student must have an advisor. If a student's advisor chooses to stop advising the student, the advisor should notify the Director of Graduate Studies (DGS). A PhD candidate should see the DGS for help if they have trouble finding an advisor, lose an advisor, or believe that their advisor is not doing enough to help the student achieve satisfactory academic progress. A PhD candidate who does not have an advisor must find an advisor within three months of learning of the need to find a new advisor. The new advisor should notify the DGS of the new advising relationship. After three months have elapsed without having an advisor, a PhD candidate will be excluded (dismissed) from the program immediately.

Review by Advisor of Research Progress

By the end of the week after finals week each Spring quarter, each student must fill out an annual report on their progress in the Graduate Student Tracking System. The advisor will review the report and provide written comments. The DGS will review the report and comments. During Summer quarter, the DGS will notify students as to whether their progress is satisfactory or unsatisfactory.

If, at any time, the advisor judges that the student's research progress is persistently unsatisfactory, the advisor will notify the DGS and provide a written description of the problem. The judgment as to whether research progress is satisfactory must take into account the student's academic progress towards degree requirements not involving research, e.g., in fulfillment of coursework or teaching requirements.

The DGS will review the information provided in the annual review and its comments, or in a notification of unsatisfactory progress, and consult with the advisor and student about the situation. Then the DGS will decide whether to put the student on probation. If so, then the DGS, in consultation with the advisor, will give the student written information as to what future progress, within what timeline, would be considered satisfactory. The advisor should provide supporting documentation of the existence of the problem, if any. Such supporting documentation could include notes from meetings of the advisor and student, emails, and the student's written research notes or products. Documentation is best able to demonstrate that progress was unsatisfactory if it states expectations for progress and demonstrates that they were not met. Advisors are urged to document expectations clearly, for each week, each quarter, or both.

The progress of a student who is on probation will be reviewed quarterly by their advisor. If the advisor judges the progress to be satisfactory, they will notify the DGS, who will remove the student from probation. If the advisor judges the progress to be unsatisfactory, they will provide the DGS with documentation of the unsatisfactory progress. The DGS, after consultation with advisor and student, will decide whether to remove the student from probation. If the student is not removed from probation within the timeline specified by TGS, the student will be excluded (dismissed) from the program.



Appeals

An appeal of the decision to put a student on probation would go to the Graduate Committee. The petitioner must submit their appeal to the Graduate Committee members, including the DGS, within 10 days of receiving the notification from the DGS of the finding of unsatisfactory progress. The Graduate Committee, including the DGS, will deliberate on the appeal. The appeal is decided by a vote of the Graduate Committee members, excluding the DGS and the student's advisor (if the student's advisor is on the Graduate Committee). If the number of votes to rescind the decision to put the student on probation is strictly greater than the number of votes to sustain the decision to put the student on probation, then the decision is rescinded. Otherwise, the decision is sustained and the student will be put on probation.

An appeal of the final decision to exclude a student who has been on probation goes to TGS. TGS policies on satisfactory academic progress, described [here](#), govern this appeals process. They also impose other criteria for satisfactory academic progress, including standards for minimum GPA, maximum number of incomplete grades, and maximum length of time to complete the PhD program.

Student Affairs

Academic Integrity

Academic Integrity Policy

The following academic integrity policy applies to all PhD courses in the IEMS Department, unless the instructor specifies an alternative policy in writing.

No sharing of course materials: Students may not receive course materials of any kind, except from the instructor. Students who have previously taken a course may not give course materials to students who have not yet taken the course. Course materials include, but are not limited to: homework assignments, homework solutions, examinations, examination solutions, and lecture notes.

Submitting One's Own Work: Unless the instructor's alternative policy forbids it, it is permitted to collaborate on homework problems with other students who are enrolled in the course at the same time. Unless the instructor's alternative policy allows it, it is forbidden to collaborate on any other submissions that affect the course grade. It is also permitted for students to receive assistance in learning the subject matter from others. However, students may not receive assistance on their assignments from anyone who is not involved in the course currently, including students who took the course previously. Students may not show written solutions or computer programs to other students, nor may they look at others' written solutions or computer programs. Mere similarity of the homework submissions of students currently enrolled in the course is not evidence of a violation of this policy, because it can arise from legitimate collaboration.

Examinations: During examinations, students may not discuss anything in the examinations with anyone other than instructor. This includes take-home examinations. "During the examination" means between the

time the examination has been distributed and the time the examination is due, including any extension of time to complete the exam.

Plagiarism: Northwestern University's Principles Regarding Academic Integrity define plagiarism as "submitting material that in part or whole is not entirely one's own work without attributing those same portions to their correct source." Plagiarism is forbidden in any work that students submit for courses, as well as in research. Students may submit work that relies on published sources, but they must cite these sources correctly. The Office of the Provost and The Writing Place have provided guidelines for avoiding plagiarism.

Do Not Suggest Violating the Rules: It is a violation of this policy to ask others to violate the rules in this policy or to offer to violate them.

Clarification: A violation of this policy is not excused if a student misinterpreted the policy.

Adjunction: Allegations of academic dishonesty are referred to The Graduate School, whose process for handling them is found [here](#). This applies to those who provide help to others in violation of the policy as well as those who receive help in violation of the policy.

Reasons for the rules:

- Sharing course materials may interfere with accurate assessment by the instructor; an example in the lecture notes one year may become a homework problem another year. Sharing course materials among students may create unfair disadvantages for students who do not have access to materials that some of their peers have. Instructors should provide students with adequate study materials, including practice exam problems. Students who want more course materials to assist in their studies should ask the instructor directly.
- Voluntary collaboration on homework among students enrolled in a course is encouraged because it often helps learning. However, it is not collaboration when a student uses written solutions or computer programs prepared by someone else. It is also not collaboration when a student gets help from someone who is not involved in the course. It is beneficial when others in the University help a student learn, but receiving help on any graded submissions from someone who is not involved in the course can too easily undermine the learning that takes place when working on them. Students who need help that they cannot get from voluntary collaboration with other students in the course should get help from the instructor in office hours. Instructors usually want to evaluate students' submissions other than homework (e.g., projects, reports) on the assumption that they represent independent effort, but instructors may sometimes choose to allow collaboration on such submissions.
- Examinations are a very important part of the instructor's evaluation of the student's learning. Any communication with others during the exam calls into question the integrity of the evaluation.
- The ability to cite others' work appropriately is an important professional skill, and plagiarism is a serious form of professional misconduct. Students must practice appropriate citation consistently, in coursework as well as in research.
- Behavior such as asking to see another student's homework solutions or offering to help another student on a take-home examination damages the Department's culture of academic integrity. It makes honest students fear that their honesty puts them at a disadvantage, and it tempts students to break the rules by making them suspect that others are breaking the rules.
- A student who is uncertain about whether something is permitted under this policy should not do it until they have learned that it is permitted by consulting with the course instructor or with the Director of Graduate Studies.
- It is the policy of The Graduate School to investigate and adjudicate alleged violations of academic honesty involving its students.



Leave of Absence

General Information

Leaves of absence are defined as a temporary separation from the University for a minimum of one quarter and a maximum of one year. For more information, please review the TGS [Leave of Absence Policy](#).

Parental Leave

General Information

The Graduate School's childbirth accommodation policy applies to enrolled (active) graduate students prior to or following the birth or adoption of a child. Graduate students who meet this requirement and wish to use the Parental Leave should refer [here](#) for more details on TGS's policy.

Nondiscrimination Statement

General Information

Northwestern University does not discriminate or permit discrimination by any member of its community against any individual on the basis of race, color, religion, national origin, sex, pregnancy, sexual orientation, gender identity, gender expression, parental status, marital status, age, disability, citizenship status, veteran status, genetic information, reproductive health decision making, or any other classification protected by law in matters of admissions, employment, housing, or services or in the educational programs or activities it operates. Harassment, whether verbal, physical, or visual, that is based on any of these characteristics is a form of discrimination. Further prohibited by law is discrimination against any employee and/or job applicant who chooses to inquire about, discuss, or disclose their own compensation or the compensation of another employee or applicant.

Northwestern University complies with federal and state laws that prohibit discrimination based on the protected categories listed above, including Title IX of the Education Amendments of 1972. Title IX requires educational institutions, such as Northwestern, to prohibit discrimination based on sex (including sexual harassment) in the University's educational programs and activities, including in matters of employment and

admissions. In addition, Northwestern provides reasonable accommodations to qualified applicants, students, and employees with disabilities and to individuals who are pregnant.

Any alleged violations of this policy or questions with respect to nondiscrimination or reasonable accommodations should be directed to Northwestern's Office of Equity, 1800 Sherman Avenue, Suite 4-500, Evanston, Illinois 60208, 847-467-6165, equity@northwestern.edu.

Questions specific to sex discrimination (including sexual misconduct and sexual harassment) should be directed to Northwestern's Title IX Coordinator in the Office of Equity, 1800 Sherman Avenue, Suite 4-500, Evanston, Illinois 60208, 847-467-6165, TitleIXCoordinator@northwestern.edu.

A person may also file a complaint with the Department of Education's Office for Civil Rights regarding an alleged violation of Title IX by visiting www2.ed.gov/about/offices/list/ocr/complaintintro.html or calling 800-421-3481. Inquiries about the application of Title IX to Northwestern may be referred to Northwestern's Title IX Coordinator, the United States Department of Education's Assistant Secretary for Civil Rights, or both.



Financial Support

Financial Aid

The IEMS Department's commitment to provide funding for each student is contained in offer letters sent to each student individually upon acceptance to the program. The most common funding package covers tuition and stipend for Fall, Winter, and Spring quarters of the first five years of PhD study. The Department's goal is to enable students to devote their full efforts and attention to completing the PhD without being concerned about securing funding. All funding is conditional on satisfactory progress in the program.

The Department aims to provide funding, even after its commitment has expired, to students who need it and are making good progress. Students who need funding after the Department's commitment has expired are encouraged to inform their advisors about their needs as soon as possible and attempt to secure research assistantships through their advisors. The decision about providing Department funding that does not come from the advisor depends on funding availability, the student's progress, and the student's suitability for the available graduate assistantships or instructorships. For this reason, the Department may not always provide support in the form most preferred by the student and advisor. For example, even if the advisor is willing to provide a research assistantship, it may be necessary

for the Department to offer a student a less-preferred form of support for purposes of managing the total supply of funding, providing teaching assistants for all classes and research assistants for all projects that need them, etc.

Fellowships

Students are encouraged to seek out other funding opportunities for themselves. These include Terminal Year Fellowships available from McCormick or fellowships from centers at Northwestern such as the Transportation Center. There are external fellowships such as those offered by Fulbright and Microsoft. Other fellowships are for students from particular countries, such as the National Science Foundation Graduate Research Fellowship in the United States. Benefits of earning such fellowships can include prestige, summer funding, and the assurance of being able to devote full time to one's own research when supported by a fellowship and not needing to rely on a graduate assistantship provided by the Department, which may entail duties not related to one's research.

Instructors

For students interested in teaching, the Department may be able to offer an instructorship. Instructor positions are awarded on an as-needed basis. To become eligible for an instructorship, students should arrange to be evaluated as guest lecturers in a class (see Teaching Requirements on Page 5 for details).

Outside Employment

University funding is provided to enable students to devote full-time effort to graduate study. As such, students agree not to hold outside employment when receiving financial aid. International students are subject to visa restrictions on employment outside of Northwestern.

In instances where the University is unable to provide financial assistance (e.g. advanced students completing the dissertation), it is recognized that students may need to secure part-time employment. Completion of degree requirements, however, should remain the top priority and a full-time pursuit. Holding full-time employment while trying to complete dissertation research is strongly discouraged, because it tends to lead to low productivity, excessive delays, or even failure to complete the program.

IEMS Department Professional Membership Policy

The Department of Industrial Engineering and Management Sciences encourages its PhD students to pursue membership in a relevant professional society as a means of expanding their research knowledge and contacts. To this end, the Department provides each student a credit of up to \$40 per year to put towards membership fees in an approved organization. Any additional expenditures must be funded by a PI or by the student. Please note that students are only eligible for this program in their first five years as a PhD student in the IEMS Department, and students in their sixth year of study and beyond will need to secure an alternate source of funds.

IEMS Computer Policy

The IEMS Department recognizes that many of its students require specialized computing resources in order to carry out their research. PhD students entering the program are provided the use of a personal desktop computer during their first year, and the specifications of this computer are designed to meet the requirements of all IEMS core courses. Upon successful completion of the Candidacy Exam at the end of the first year, students are permitted to make use of the personal computing allocation outlined in their offer letters. This funding can be used to purchase computers and related supplies directly applicable to the student's research, with applicability reviewed by the Senior I.T. Consultant prior to purchase. Students who wish to exceed the budget allocated for them are welcome to do so, and must present a personal check for the overage directly to the Graduate Program Assistant prior to the completion of the order. Students who leave the program without a PhD degree must return all materials purchased with the computer funding allocation to the Senior I.T. Consultant prior to leaving campus. Please feel free to contact the Graduate Program Assistant with any questions regarding this policy.

Conferences and Workshops: The IEMS Department matches, twice during a student's graduate career, the TGS Travel Grant. Please make sure to check with the Graduate Program Assistant regarding exact details and restrictions. PhD students may also have funding available from their dissertation advisors for conference travel.

TGS Travel Grant: The TGS Conference Travel Grant provides funds to assist PhD students traveling to conferences and/or seminars on behalf of the University. The award is not intended to support attending courses at other schools, research or general educational travel. TGS permits students to make use of this program twice during their careers at Northwestern. The IEMS Department will provide an equivalent amount in matching funds for both uses of the grant during their first five years in the program.



IEMS Travel Grant for 1st and 2nd Year Students: This grant is awarded one time only during a student's first three years for travel to an IEMS-recognized conference. The funds are for a single use, and cannot roll over past a student's 3rd year. This is in addition to the two-time matching funds for the TGS Travel Grant. For details see the Graduate Program Assistant or Financial Coordinator and complete the IEMS Travel Grant Form (Appendix F). All funds supporting such travel require the student to present research at the conference or workshop.

Dependent Care Grant: The TGS Dependent Care Grant provides funds to assist PhD students, with dependents, so that they may participate in professional development opportunities. Please refer to the [TGS website](#) for application deadlines and eligibility requirements.

The Department

Director of Graduate Studies

Professor Seyed Iravani

Staff

Kendall Minta

Business Administrator
Payroll
Planning and Analysis
Departmental Oversight

Colleen Sweeney Walker

Financial Coordinator
Accounts Payable
Purchase Orders
Reimbursements

Stephen Pedersen

Graduate Program Assistant
Admissions
Graduate Recruiting

Sarah Cowles

Research Administrator
Sponsored Funding
Award Management

Agnes Kaminski

Program Assistant
Coordinates Conference Preparations
Assists with Special Projects
Manages Purchasing

Johnathan Gaetz

Senior IT Consultant
Computing Administration, purchasing and support
Manages IEMS computer lab

Graduate Faculty

Bruce Ankenman

Daniel Apley

Noshir Contractor

Seyed Iravani

Diego Klabjan

Simge Kucukyavuz

Vadim Linetsky

Edward Malthouse

Sanjay Mehrotra

David Morton

Barry Nelson

Jorge Nocedal

Ohad Perry

Matthew Plumlee

Chang-Han Rhee

Karen Smilowitz

Ajit Tamhane

Andreas Waechter

Zhaoran Wang

Ermin Wei

Graduate Liaison Committee

Pol Boada Collado

Xiaochun Niu

Qimeng Yu

The Graduate Liaison Committee's student representatives share student concerns, raise and discuss issues, and help gather information from other students and convey information to PhD program leadership. Students can volunteer to join the committee. INFORMS student chapter board members are student representatives on the Graduate Liaison Committee. Any student who wishes to make suggestions or inquiries can do so through Graduate Liaison Committee members or approach the Graduate Program Assistant or DGS directly.

INFORMS Student Board Members

Mariana Escallon Barrios (President)
Nazlican Arslan
Guyi Chen

Eugene Wickett
Harun Avci
Akhil Singla

The NU INFORMS Student Chapter is a student-run organization, which serves the students of the Industrial Engineering and Management Sciences Department at Northwestern University. The INFORMS Student Chapter provides opportunities for academic, professional and personal development. The chapter organizes brown bags, career panels and social events throughout the year and assists the Department to build a friendly environment.

Appendices

Appendix A: Majors and Minors

Courses that Count Towards Majors and Minors in the IEMS PhD Requirements

The following areas can be chosen as majors or minors in the IEMS PhD course requirements.

- Analytics (minor only)
- Stochastic Analysis and Simulation
- Optimization
- Financial Engineering
- Logistics and Operations
- Healthcare Engineering
- Applied Statistics and Statistical Learning
- Management Science

In general, any two courses in an area fulfill a minor, and any four courses in an area fulfill a major. The exceptions are that there is no major in Analytics (only a minor), and the rules for Healthcare Engineering are more complicated (as explained below).

Some courses belong to multiple areas, but courses *cannot* be counted towards multiple areas at the same time in a student's degree plan. Each course taken can be counted only once towards fulfilling the degree requirements.

Courses may not appear here, even if they were approved to count towards an area in the past, if they have not been taught in recent years. They may appear in gray if future offerings are in doubt.

Analytics

There is a minor in Analytics, but no major.

- IEMS 455 Machine Learning
- IEMS 462-1 Predictive Analytics I
- IEMS 462-2 Predictive Analytics II
- MSiA 420 Predictive Analytics
- MSiA 421 Data Mining
- MSiA 490-23 Health Analytics and Decision Making
- MSiA 490-21 Predictive Models for Credit Risk Management
- MSiA 490 (Selected Topics) Smart Grid Analytics
- MSiA 490-20 Text Analytics
- MSiA 490 Reinforcement Learning for Artificial Intelligence
- ELEC_ENG 435 Neural Networks
- COMP_SCI 496: Advanced Topics in Deep Learning

Applied Statistics & Statistical Learning

- IEMS 462-1 Predictive Analytics I
- IEMS 462-2 Predictive Analytics II
- IEMS 463 Statistical Analysis of Designed Experiments
- IEMS 465 Simulation Experiment Design and Analysis
- IEMS 490 Statistical Learning
- IEMS 490 Uncertainty Quantification
- ECON 480-1,2,3 Introduction to Econometrics
- ECON 481-1,2,3 Econometrics
- ECON 482 Applied Econometrics: Time-Series Methods
- ECON 483 Applied Econometrics: Cross-Section Methods
- ELEC_ENG 433 Statistical Pattern Recognition
- COMP_SCI 574 Probabilistic Graphical Models
- FINC 520 Time Series Analysis

- MECS 577 Introduction to Applied Econometrics 2
- MECS 578 Introduction to Applied Econometrics 3
- STAT 325 Survey Sampling
- STAT 348 Applied Multivariate Analysis
- STAT 350 Regression Analysis
- STAT 351 Design and Analysis of Experiments
- STAT 352 Nonparametric Statistical Methods
- STAT 355 Analysis of Qualitative Data
- STAT 356 Hierarchical Linear Models
- STAT 359 (Topics) Data Mining
- STAT 420-1,2,3 Statistical Theory & Methodology
- STAT 448 Multivariate Statistical Methods
- STAT 453 Survival Analysis
- STAT 454 Time-Series Analysis
- STAT 455 Advanced Analysis of Qualitative Data
- STAT 457 Applied Bayesian Inference
- STAT 461 (Topics) Theory of Statistical Data Mining
- STAT 461 (Topics) Advanced Survey Sampling
- STAT 465 Statistical Methods for Bioinformatics and Computational Biology
- *University of Chicago: STAT 31150 Inverse Problems and Data Assimilation

Financial Engineering

- IEMS 461 Advanced Stochastic Models
- IEMS 473 Financial Engineering
- IEMS 475 Simulation in Financial Engineering
- ELEC_ENG 495 Game Theory and Networked Systems
- FINC 585 Introduction to Financial Theory / 485-1 Asset Pricing I
- FINC 587 Dynamic Asset Pricing Theory / 485-2 Asset Pricing II
- FINC 588 Econometrics of Financial Markets

Healthcare Engineering

Courses that belong to Healthcare Engineering are classified as category A, B, or C. A minor requires two courses from category A. A major requires at least two courses from category A, three from A + B, and four from A + B + C.

Category A

- MSiA 490 (Selected Topics) Healthcare Analytics
- IEMS 443 Health Policy Modeling
- IEMS 444 Health Management Science
- IEMS 445 Decision and Risk Analysis

Category B

- IEMS 490 (Selected Topics) Humanitarian and Non-profit Logistics
- STAT 453 Survival Analysis
- STAT 465 Statistical Methods for Bioinformatics and Computational Biology

Category C

- IEMS 441 Social Network Analysis
- PUB HLTH 444 Advanced Decision Analysis

Optimization

- IEMS 451 Stochastic Optimization
- IEMS 452 Combinatorial Optimization
- IEMS 453 Robust Optimization

- IEMS 454 Large-Scale Optimization
- IEMS 455 Machine Learning
- IEMS 457 Integer Programming
- IEMS 459 Convex Optimization
- IEMS 469 Dynamic Programming
- IEMS 490 (Selected Topics) Data-Driven Decisions Under Uncertainty
- IEMS 490 (Selected Topics) Machine Learning
- IEMS 490 (Selected Topics) Robust Optimization
- IEMS 490 (Selected Topics) Stochastic Optimization
- IEMS 490 (Selected Topics) Conic
- COMP_SCI 457 Advanced Algorithms
- ELEC_ENG 424 Distributed Optimization
- MECS 560-1 Foundations of Managerial Economics I: Static Decision Models
- MECS 560-2 Dynamic Optimization

Management Science

- EECS 472 Designing and Constructing Models with Multi-Agent Languages
- IEMS 411 Field Research in Organizations
- IEMS 430 Systems Analysis
- IEMS 432 Systems Engineering
- IEMS 433 Theory and Practice of Evaluation
- IEMS 434 Systems Methodology
- IEMS 436 Engineering Project Management
- IEMS 441 Social Network Analysis
- IEMS 490 (Selected Topics) Computational Social Science
- CEE 482 Evaluation and Decision-Making for Infrastructure Systems
- ECON 414-3 Economics of Information
- MORS 524-1 The Individual and the Organization
- MORS 524-2 Social Processes in Organizations
- MORS 525-1 Behavior in Organizational Systems
- MORS 525-2 Organizations in their Environments
- MORS 526-1 Micro-Organizational Research Methods
- MORS 526-2 Macro-Organizational Research Methods
- MORS 522 Economics, Social Psychology and their Experiments
- MTS 525 (Selected Topics) Peer Production: Collective Action & Organization
- ELEC_ENG 495 Game Theory and Networked Systems
- MECS 549-2 Technology and Innovation II

Logistics & Operations

- IEMS 482 Routing and Scheduling
- IEMS 489 Transportation Network Design and Operation
- IEMS 490 (Selected Topics) Humanitarian and Non-profit Logistics
- IEMS 490 (Selected Topics) Service Systems
- CEE 471-1,2 Transportation Systems Analysis
- CEE 479 Transportation Systems Planning and Management
- CEE 480-1,2 Travel Demand Analysis and Forecasting
- CEE 482 Evaluation and Decision-Making for Infrastructure Systems
- OPNS 521 Foundations of Operations Management
- ELEC_ENG 495 Game Theory and Networked Systems

Stochastic Analysis & Simulation

- IEMS 451 Stochastic Optimization
- IEMS 461 Advanced Stochastic Models
- IEMS 464 Advanced Queueing Theory
- IEMS 465 Simulation Experiment Design and Analysis
- IEMS 468 Stochastic Control
- IEMS 469 Dynamic Programming
- MATH 450-1,2 Probability
- MATH 450-3 Stochastic Analysis III
- MATH 455-1,2 Stochastic Analysis
- OPNS 516 Stochastic Foundations
- OPNS 522 Queueing Networks: Performance Analysis
- *University of Chicago Management Science and Operations Management: Queueing Models for Service Operations Management (40911) (Half Credit Course)

Appendix B: Designed Major & Minor Request Form

NAME: _____ ID: _____

ENTRANCE IN PROGRAM: Fall 20____ DATE OF REQUEST: ____/____/____

Requests cannot be made any earlier than after the completion of one year of study.

In their initial three years, PhD students also complete a 4-course major and two 2-course minors consisting of graduate level courses from IEMS and other selected engineering departments. Majors and minors may be chosen from the following areas:

- Analytics
- Stochastic Analysis & Simulation
- Optimization
- Financial Engineering
- Logistics & Operations
- Healthcare Engineering
- Applied Statistics & Statistical Learning
- Management Science

Representative courses in these areas are listed in the Ph.D. Major and Minor Areas Document. Students also may petition to substitute a major or minor area of their design with approval from their advisor and the Graduate Committee. Please list the courses below and the name of the designed major or minor. **A different form must be submitted for each designed area.**

TITLE: _____ CIRCLE: MAJOR MINOR

COURSE 1: _____ Year Taken: _____
Full Course Title and Instructor

COURSE 2: _____ Year Taken: _____
Full Course Title and Instructor

COURSE 3: _____ Year Taken: _____
Full Course Title and Instructor

COURSE 4: _____ Year Taken: _____
Full Course Title and Instructor

Student Signature: _____ Date: _____

Advisor Signature: _____ Date: _____

Do not mark below this line – DGS use only

Date Presented to Graduate Committee: _____

_____ I approve the designed area as listed

_____ I approve the designed area with the following modifications (See below)

Modifications:

Graduate Director Signature: _____ Date: _____

Do not mark below this line – Office use only

Date Processed: _____ Graduate Program Assistant Signature _____

Appendix C: Required Course Waiver Request Form

Dept. of Industrial Engineering and Management Sciences
Northwestern University

Instructions: Use this form to request a waiver of the requirement that a course be taken for the M.S. or Ph.D. in IEMS, justified by graduate-level coursework previously done at another institution. Submit this form along with documentation of your previous graduate-level coursework, such as transcript, syllabi, course descriptions, and reading lists.

Policies:

- A waiver of a required course does not reduce the total number of courses required for the degree.
- If a core course is waived, you must take another course during the first year as a substitute for the waived core course. The substitution is subject to the approval of the Director of Graduate Studies. The substitute course must be in the same subject area and at least as valuable in assessing first-year student achievement.

IEMS course requirement to waive: _____

Substitute course (if applicable): _____

Previous graduate-level coursework:

University	Department	Course #	Course Name	Grade

I request a waiver of the requirement to take the IEMS course listed above. If it is a core course, I understand that I am required to complete the approved substitute course during my first year.

Student Name: _____

Student Signature: _____

Date: _____

.....
I approve the waiver request and, if applicable, course substitution.

Director of Graduate Studies Signature: _____ Date: _____

Appendix D: IEMS Expectations for Teaching Assistantships

In November 2013, The Graduate School endorsed guidelines for expectations regarding teaching assistantships: <http://www.tgs.northwestern.edu/funding/assistantships/graduate-and-teaching.html>

To express the policy of the IEMS Department towards teaching assistantships within IEMS, this document repeats some of the TGS guidelines, modifies or clarifies them, and adds further guidelines.

Instructor and TA should work together as a team to support learning by students in their course. In the event that one of them apparently fails to meet the expectations set forth in this document, they should have a civil and candid discussion about how to meet the expectations. If agreement is impossible or repeated problems emerge, the IEMS Director of Graduate Studies should be notified (if the TA is an IEMS PhD student).

The Department encourages TAs to partake of Departmental and University programs that enhance pedagogical knowledge and proficiencies. This includes Departmental TA training and having their lectures evaluated (see the last section of this document). Also, graduate students interested in resources to support their work as TAs and development as teachers can consult these links:

- Searle Center for Advancing Learning & Teaching (University-wide): <https://www.northwestern.edu/searle/>
- Center for Integration of Research, Teaching and Learning (specific to science, technology, engineering, and math): <https://www.northwestern.edu/searle/initiatives/grad/cirtl/index.html>

Responsibilities of Teaching Assistants

Approach the TAship as a learning experience complementary to other aspects of graduate education.

Meet regularly the faculty supervisor, request feedback, and seek opportunities to continually develop pedagogical proficiencies.

Workload

Dedicate up to 15 hours per week (averaged over the quarter) to TA duties. You may need to spend more than 15 hours in some weeks.

Timeliness

Manage the assigned TA responsibilities along with other academic work, keeping to deadlines. Find out the instructor's specific expectations for deadlines for completing TA duties, such as submitting a draft of a problem set before it is to be assigned or returning graded assignments. Unless otherwise specified by the instructor, it is generally expected that assignments be graded within one week of the due date.

Labs

If the course has a computer lab or recitation section, it is usually the responsibility of TAs to manage or teach it. You may need to write some or all of the lab assignments or lessons.

Being Well-Informed

Course Material

Acquire proficiency in the course content and methodologies, complemented by appropriate pedagogical methods. Know all of the material that students are expected to learn, including case studies (if applicable), so that you are prepared to answer student questions. If you are not already familiar with the course content, you may be expected to attend lectures. Review all assignments before or when they are distributed to the students, so that you are prepared to answer student questions.

Procedures

Become familiar with University and College or School policies, requirements, and deadlines pertaining to topics such as academic integrity, safety protocols, maintaining a classroom respectful of diversity, as well as the Registrar's procedures and deadlines.

- Academic integrity procedures applicable to undergraduate engineering courses are at <http://www.mccormick.northwestern.edu/students/undergraduate/academic-integrity.html>. If you suspect a violation of academic integrity, alert the instructor immediately.

Helping Students

Office Hours

Hold regular scheduled office hours. You should choose the times of your office hours in consultation with the instructor, and publicize the time and location to the class. The usual location is the TA room, C236, but larger rooms can be reserved if needed because many students attend office hours at once. If it becomes necessary to cancel office hours on one occasion, the TA should notify the instructor and students of the cancellation promptly, and discuss scheduling make-up office hours with the instructor.

Other Contact

Students may request meetings with you outside of office hours or ask questions by email. You should try to accommodate these requests, as long as it does not result in an excessive workload or interfere with your other academic commitments. You may encourage students to use office hours as the best time to ask questions, but keep in mind that some students will be unable to attend office hours.

TAs are expected to respond to student emails within one business day.

Tutoring

No TA may be paid to tutor any undergraduate student in the work of a class being taught by that same TA.

Appendix E: Course Verification Form

This must be completed and signed at the time of your prospectus exam to verify you are successfully progressing towards degree completion. Any courses that have not been completed must be finished by the end of the fourth year of enrollment in the program.

Please return this form to the Graduate Program Assistant at the time of your prospectus exam.

Student Name:	Starting Date:
----------------------	-----------------------

Category	Course	Title	Quarter Taken	Professor	Grade	Anticipated Enrollment Quarter (if not yet taken)
<i>Core</i>	IE 401	<i>Applied Mathematical Statistics</i>				
	IE 435	<i>Stochastic Simulation</i>				
	IE 450-1	<i>Mathematical Optimization I</i>				
	IE 450-2	<i>Mathematical Optimization II</i>				
	IE 460-1	<i>Stochastic Processes I</i>				
	IE 488	<i>Economics and Decision Analysis</i>				
	IE 490	<i>Statistical Learning</i>				
	OPNS 516	<i>Stochastic Foundations</i>				
<i>Applied</i>	Applied 1					
	Applied 2					
<i>Major:</i>	Area:					
<i>Course 1</i>						
<i>Course 2</i>						
<i>Course 3</i>						
<i>Minor 1:</i>	Area:					
<i>Course 1</i>						
<i>Course 2</i>						

Exam	Date Taken	Committee Members	Result
<i>Candidacy Exam</i>			PASS
<i>Prospectus (Proposal)</i>		Chair:	

TGS TA Requirement	Course	Course Professor	Quarter/Year	Results

Student Signature: _____ Date: _____

Advisor Signature: _____ Date: _____

Department Signature: _____ Date: _____

Appendix F: Travel Grant Form for 1st, 2nd, and 3rd Year Students

If you are an IEMS PhD student and wish to travel to an IEMS recognized conference during your first, second, or third year in the Department and are without funding from your advisor; you are eligible for the IEMS Travel Grant. This grant is awarded one time only during your first three years. All funding is given out at the Department's discretion. You do not need to be a presenter in order to qualify.

To begin, complete this form in its entirety and return to the Graduate Program Assistant.

Conference Name:

Conference Location:

Conference Date:

Why are you going to the conference?

Breakdown of Funds:

Airfare	\$.
Hotel	\$.
Conference Registration Fee	\$.
Estimate of Food Costs	\$.
Other	\$.
Total:	\$.

Student Name:

Student Signature:

Advisor Name:

Advisor Signature:

Graduate Program Assistant Signature:

Financial Coordinator Signature:

Date Submitted to Graduate Program Assistant: