GRADUATE STUDENT HANDBOOK
Graduate Student Policies, Procedures and Requirements

Department of Industrial and Systems Engineering
Texas A&M University
2017-18 Edition
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IMPORTANT INFORMATION

WHAT IS NEW IN THIS EDITION OF THE HANDBOOK?

- Four options in Master of Science in Industrial Engineering (Thesis and Non-Thesis)
- New guidelines for preliminary examination, proposal and final exam
- English Language Proficiency Certification requirements
- Detailed information on policies related to ISEN 684, course load during a semester, academic dishonesty, and training and safety
- Modified MS IE degree plan checklist for different area requirements

CONTACT INFORMATION

These are the individuals who are your primary point of contact for the graduate program:

Ms. Erin Roady, Graduate Program Coordinator
Email: erinroady@tamu.edu
Phone: (979) 845-5536

Dr. Amarnath Banerjee, Associate Head for Graduate Affairs
Graduate Program Director
Email: banerjee@tamu.edu
Phone: (979) 458-2341
CHAPTER 1

GETTING STARTED

This manual provides information about the graduate programs in the Industrial and Systems Engineering Department at Texas A&M University to new and continuing graduate students. It establishes governing policies on a variety of topics including degree programs, q-drops, examinations, and financial assistance. Additional information is available in publications from the University Office of Graduate and Professional Studies and in the Graduate Catalog.

REGISTERING FOR CLASSES

- The Office for Graduate Programs, located in Room 4060 Emerging Technologies Building (ETB), assists new graduate students with initial course selection and with identifying potential faculty advisors. These are discussed during the orientation sessions held about a week before the start of a semester. The Graduate Program Coordinator can help with any of the administrative requirements related to your education at Texas A&M University.

- The Schedule of Classes for each semester can be obtained through the Howdy Portal. Registration is also accomplished through the Howdy Portal by utilizing the Add/Drop Courses link on the My Record tab.

- When a class you want is filled, you must obtain written (or email) permission from the course instructor before you can be forced into the class by the Graduate Program Coordinator.

- Registration for courses requiring an advisor (a 685 directed studies course, a 692 project course, a 684 internship course) must be approved through the Graduate Program Coordinator.

- Starting this academic year, we are allowing students to automatically enroll for 691 research hours. You must talk to your advisor or the faculty member with whom you intend to do research prior to self-enrolling in 691. During the discussion, you must agree on the number of research credit hours that you will be enrolling in. If you enroll in a 691 section without discussing with the faculty member, you will be dropped from that section. You will be responsible for all fees and financial penalties that are incurred.

- Additionally, departmental approval is necessary if an industrial and systems engineering graduate student wishes to register in any undergraduate courses.

DEFAULT ADVISOR

A student can seek any faculty member to be their academic advisor, especially if a student already has a specific research interest. In the absence of a faculty advisor, the department’s director of graduate programs acts as the default advisor for all master’s students and Ph.D. students who
have not chosen his/her dissertation advisor. Students should not feel obligated to choose the default advisor as chair of their advisory committee. The advisory committee is discussed in the "Graduate Program Requirements" section.

**GRADUATE OFFICES AND DESK SPACE**

Limited office space is available for graduate students. Offices are assigned according to departmental teaching and research needs. Requests for office space should be made to the director of graduate programs by a student’s advisor.

**COMPUTER FACILITIES**

The department maintains computers and facilities for industrial and systems engineering faculty, staff, and students. Microcomputers for student use are located on the third floor of the Emerging Technologies Building. The college has set up Windows Virtual Machine that allows you to run some of the frequently used software as “apps” on your device (Windows PC, Mac, tablet, etc.). This requires installing and accessing the Citrix receiver on your local machine. The virtual machine can be used both on-campus and off-campus. Instructions on how to get set up with the Citrix system is available at: [http://ise.tamu.edu/CitrixInstructions.pdf](http://ise.tamu.edu/CitrixInstructions.pdf). New students should check with the IT office (ETB Room 3019 or Student Computing Lab Room 3005) for instructions on setting up an industrial and systems engineering computer account. All computer users are asked to avoid waste (e.g., unnecessary printouts, use of laser printer for draft documents, etc.) and to be considerate of others using the facilities. The department uses a “card swipe” system to control entry into the computer rooms, so students will need their university identification for access to use the departmental computers. Each person entering the computer room after hours must use their own identification to gain access. Please comply with the rules and polices established for these facilities.

The university has several computer centers available to all students. Some of the centers with easy access to students from ETB are the ones located in Room 021 WERC, Room 133 in Blocker, and in the Student Computing Center (SCC) next to Evans library. The computer center in Teague is also a graphics lab for students needing support with graphics output, color slides, etc.

**TRAVEL AND LEAVE REQUESTS**

Some students might have to travel on university business (usually because of a research project). Before traveling on university business, a travel and leave request must be submitted and approved. Reimbursement for travel expenses requires an account number that can be obtained from either the research supervisor or the advisory committee chair. The amount of expenses that can be paid by the university depends on the type of research contract and the trip’s destination. Check with the financial management staff regarding allowable expenses and procedures for approval. Travel and leave must be approved before leaving or expenses cannot be reimbursed and insurance coverage is jeopardized. After the trip, a travel voucher must be filed to justify the claimed expenses.
MAILBOXES
Each graduate student is assigned a mailbox. The master’s students’ mailboxes are located in the 4th floor hallway adjacent to the Grad Student Offices/Lounge area in 4050. The Ph.D. students’ mailboxes are located inside 4050 ETB. Important university correspondence is delivered to student mailboxes, so students should be in the habit of checking their mail at least once per week, if not more often. The address for receiving off-campus mail is:

[Student Name]
Industrial and Systems Engineering Department
Texas A&M University
3131 TAMU
College Station TX 77843-3131

For on-campus mail, the address for the Industrial and Systems Engineering Department is Mail Stop 3131. Boxes for outgoing mail (off-campus and on-campus) are next to the copier (room 4030) across from the department head’s office. Off-campus mail requires correct postage.

Mailbox assignments change each semester to accommodate new students and clear out the boxes of those who have graduated. Please check the numbered list on the side of the mailbox wall each time you check your mail to ensure that you are looking in the correct box.

COMMON AREAS
Graduate students have free use of the kitchen and dining area located in Room 4050. Please clean up after yourself and remove old food from the refrigerator regularly. Also note that all desks (cubicles, along the walls, anything with a number tag in the corner of the desk) in 4050 are by assignment only, though the eating area and end tables are open-use. Graduate students also have use of the lobby seating area, outdoor common areas, teaming areas throughout the building, and may request the use of IE-controlled conference rooms. There is also a small kitchenette located on the third floor across from the computer lab. Free day-use lockers are also located next to the third floor computer lab.

PAYMENT OF FEES
Fees can be paid by mail, through the Howdy Portal or in person at the General Services Complex, Suite 2801. The waiver of out-of-state fees is automatically made for fellowship and eligible scholarship students. Please note that the University does not accept Visa payment cards at this time.

EMERGENCY LOANS
Short-term loan funds at Texas A&M University have been established to provide assistance to students who experience temporary financial difficulty in connection with educational or educationally related expenses. Additional information can be found at the Student Financial Aid website.
CHAPTER 2

GRADUATE PROGRAM REQUIREMENTS

The Texas A&M University Graduate Catalog is available online and the Texas A&M University Thesis Manual is also available online.

The university has designated certain course numbers to be reserved for specific purposes. ISEN 691 is for thesis or dissertation research; ISEN 692 is for research/projects for non-thesis degrees; ISEN 685 refers to a directed studies course; ISEN 681 is a seminar, in which faculty and students present their research results; and ISEN 684 is for industrial internship. The courses ISEN 681, 684, 691 and 692 are taken on a pass/fail basis with a final grade of “S” (satisfactory) or “U” (unsatisfactory). In ISEN 685 students must be given a letter grade; therefore, at the start of the semester, it is important to know what is expected for the semester’s work (refer to the policy) and a syllabus must be provided by the instructor to the Graduate Program Coordinator. A grade of “I” (Incomplete) in ISEN 685 is appropriate only for sickness or other extenuating circumstances.

ISEN 689 refers to “Special Topics” courses and usually covers developing research areas. Each time a new ISEN 689 course is taught, it has a different title that begins with "Special Topics in ...." When making out degree plans, it is important to use the exact title of the course as it is listed; otherwise, the Office of Graduate and Professional Studies will assume you never took the course.

DEPARTMENTAL PREREQUISITES

The prerequisites listed below are intended to ensure an adequate background in mathematics, computing, and engineering prior to pursuing graduate studies in industrial and systems engineering. In addition to departmental prerequisites, there may be prerequisites required by individual graduate advisory committees and by course instructors. Courses have been identified by their titles in the Texas A&M University Course Catalog. If you did your undergraduate work elsewhere, read the course description to assess if the course you took at another institution could qualify.

1. Two courses of engineering calculus: (MATH 151 and 152),
2. Two additional mathematics courses that require differential equations and linear algebra: (MATH 308 and 304),
3. A course of mechanics or calculus-based physics: (PHYS 218),
4. A course in calculus based probability and statistics: (STAT 211, STAT 212),
5. A course in scientific programming or computing: (CSCE 206).

No prerequisite course may be taken on a pass/fail basis, and students must average a “B” or better in their prerequisites with no single grade being less than a “C.” Students with a cumulative grade point ratio for their prerequisites of less than a 3.0 will be placed on probation. If a student makes less than a 3.0 for prerequisite work while on probation, the department will ask the Office of Graduate and Professional Studies to remove him/her from the department’s graduate program. Although graduate courses may be taken before all prerequisite requirements have been
satisfied, students must make significant progress each semester towards satisfying their prerequisites.

Most applicants lacking the prerequisite background are denied admission. Some applicants lacking the required prerequisites may be granted admission but with prerequisite courses required and identified at the time of admission. The assignment of these courses is made on the basis of transcripts and other evidence presented with the application. Because transcripts and records often do not clearly indicate course content, some prerequisite course assignments may be inappropriate. If an entering student feels this is the case and has proper documentation of course content, then the director of graduate programs can waive the course requirement. If a student claims to know the subject matter in a given prerequisite, but a transcript does not support that claim, then the student may request a waiver of the prerequisite course and take an appropriate graduate level course. If the student successfully passes the graduate level course, the prerequisite will be waived, and the graduate course may be used on the degree plan if it is acceptable to the student’s advisory committee.

**ENGLISH LANGUAGE PROFICIENCY**

The University requires, for non-U.S. citizens/lawful permanent residents whose native language is not English, either a TOEFL score of at least 80 (IBT or equivalent CBT/PBT score), no more than 2 years old at the time of entrance, or an IELTS total band score of 6.0, no more than 2 years old at the time of entrance, or a GRE-Verbal score of at least 146 (400 on old test score range), no more than 5 years old at the time of entrance, or a final degree certificate and final transcripts from a 4-year bachelor’s program, completed in its entirety in the United States. The Office of Graduate and Professional Studies also requires that all non-U.S. students be verified for English language proficiency. Verification is accomplished by meeting the admissions standards of the TOEFL or GRE-verbal tests; thus, if an applicant is admitted below the university requirements, the student must either retake the TOEFL/IELTS/GRE and receive the required test scores after being admitted, or pass the English language certification (described next).

English Proficiency Certification is required by the State of Texas and Texas A&M **before** an international graduate student is eligible to serve as a Graduate Assistant-Teaching or in any other position considered to be a teaching position (e.g. instructor, lecturer, etc.). International graduate students can certify for English proficiency before enrollment by achieving requisite scores on the speaking section of the following standardized tests: TOEFL, IELTS or PTE exams. There are three levels of eligibility for international graduate students serving in teaching positions. Table 1 shows the range of scores for each level:

**Level 1:** Students eligible for teaching assignments

**Level 2:** Students conditionally eligible for teaching assignments for one semester only, but must simultaneously participate in Center for Teaching Excellence English Language Proficiency (CTE-ELP) instruction and achieve a certifying score on the ELPE by the end of the semester.
Level 3: Students not eligible for teaching assignment. Students should participate in spoken language training (such as those provided by CTE-ELP) to assist them in meeting English language proficiency requirements.

TABLE 1. ELIGIBILITY LEVELS BASED ON ENGLISH SCORES FROM STANDARDIZED TESTS AND ELPE

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<thead>
<tr>
<th>Level #</th>
<th>Global Standardized Tests</th>
<th>Locally Administered on campus</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>TOEFL Speaking Section</td>
<td>IELTS speaking section</td>
</tr>
<tr>
<td>1</td>
<td>26 – 30</td>
<td>&gt;= 8.0</td>
</tr>
<tr>
<td>2</td>
<td>23 – 25</td>
<td>7.0 – 7.5</td>
</tr>
<tr>
<td>3</td>
<td>&lt; 23</td>
<td>&lt; 7.0</td>
</tr>
</tbody>
</table>

If an international graduate student who wishes to serve in a teaching position did not achieve requisite standardized test scores prior to enrollment, he/she can get certified by taking the on-campus English Language Proficiency exam (ELPE). **Students who received teaching assistant (TA) assignment but fail to be ELPE-certified at the time to start the TA duty will be downgraded to an hourly paid grader.** ISEN department requires that all Ph.D. students (non-U.S. citizens/permanent residents) whose native language is not English be *certified* for English language proficiency prior to their graduation. The university administers an *English Language Proficiency Exam* (ELPE) to students before each semester and several times throughout each school year. *Certification* for English language proficiency is achieved by passing the reading, listening, composition, and oral portions of the ELPE. Students register for the ELPE online at [http://dars.tamu.edu/Testing/ELPE](http://dars.tamu.edu/Testing/ELPE).

There are off-campus tutoring services, such as [EnglishBCS](http://dars.tamu.edu/Testing/ELPE), that provide English language coaching and tutoring services. Please note that the department is not endorsing this tutoring service by any means, and there are several other options available. This information is being provided as a courtesy for students requiring additional assistance for improving their English skills.

*Not making suitable progress towards required English proficiency is grounds for termination of financial support made through teaching assistantships, research assistantships, scholarships, or fellowships.*

**DEGREE PLANS AND ADVISORY COMMITTEE**

The degree plan is the official document establishing a student's advisory committee and the specific courses required for the degree. Please note that students pursuing a Master of Engineering (ME) degree and Master of Science (MS) degree *non-thesis option* (including both MS in INEN and MS in ENSM) only require a Chair or Advisor, not a full committee, although
upon the student’s request and agreed by the chosen faculty members, a full committee can be formed as well. This Chair is by default the Graduate Program Director, but the student may choose another faculty member to serve as their Chair, if desired by both parties. Master of Science (MS) degree thesis option students require at least 3 members including a Chair from ISEN, another member or Co-Chair, and a member from a non-ISEN department. Doctoral (PhD) students must have at least 4 members, following the basic guidelines for a MS student, with the addition of another member. The degree plan is the only document that officially qualifies the transfer courses from other universities that count toward the student’s degree. The specific guidelines for degree plans are described under the "Master's Degrees" and "Doctoral Degrees" chapters. This is an overview of the steps for establishing a degree plan:

1. During the first semester, choose a direction for your emphasis within the department (i.e., decide on the specific degree in which you are interested and which aspect of industrial and systems engineering you want to emphasize with your electives or research). To help you in choosing a specific research direction, if applicable, the Industrial and Systems Engineering webpage contains a listing of the faculty, their research and teaching interests, course descriptions, and a description of the major research initiatives within the department.

2. Discuss with one or more faculty members within the department your career objectives and what his/her degree plan and research requirements are. The process of establishing a degree plan is, in part, a search for compatibility between your career goals and the faculty member's research philosophy.

3. When you have determined the professor you would like as your advisor, ask that faculty member if he/she will serve as the chair of your advisory committee. Once an advisor is established, discuss with the advisor other individuals who could potentially serve as members of the advisory committee.

4. Courses and committee members for the degree plan are entered on-line. Care must be taken in filling out the forms properly (especially with respect to the names of 689 courses) to ensure that the Office of Graduate and Professional Studies (OGAPS) has proper records. General course requirements, other than your committee's, are listed in the following chapters of this document under the particular degree of interest. It is important to remember that committee members may have requirements in addition to the departmental requirements.

PETITIONS

After the degree plan has been approved, it is still possible to change course selections. A petition to OGAPS accomplishes any variation to the degree plan. (Petitions may be completed on the same web site http://ogsdpss.tamu.edu.) Petitions are submitted online and then approved by all committee members. OGAPS petitions, once approved by the students' advisory committee, are routinely approved by the Director of Graduate Program as long as university and departmental guidelines are followed, and the change does not appear to be an attempt to solely improve the degree plan grade point ratio.
Petitions are also used to change departments and restructure committees. Once a committee is formed, petitions must be approved by all committee members (both old and new members, if the committee itself is changing) as well as the Director of Graduate Program. If the petition includes changing departments, the Director of Graduate Program of both departments must approve it.

**COMMITTEE RESPONSIBILITIES**

The student’s graduate advisory committee has the responsibility of assessing the appropriateness of the proposed degree program, research proposal, thesis or dissertation, and the final examination. In addition, the committee is expected to provide periodic advice and assistance to the graduate student. At the doctoral level, the committee also has responsibility for the *Ph.D. preliminary examination*. 
CHAPTER 3

MASTER’S DEGREES

MASTER’S DEGREES OVERVIEW
The department offers three master’s degrees: The Master of Science degree in Industrial Engineering (M.S. in INEN), the Master of Engineering degree in Industrial Engineering (M.Eng. in INEN), and the Master of Science degree in Engineering Systems Management (M.S. in ENSM).

The M.S. in INEN degree requires at least 32 hours when the thesis option is selected and at least 36 hours when the non-thesis option is selected. The M.S. in INEN is designed to prepare students for ISEN Ph.D. program in the areas of Operations Research, System Informatics, Human Factors, and Manufacturing. The courses are theory and methodology oriented.

The Master of Science in Engineering Systems Management (M.S. in ENSM) serves the dual purposes of (a) train students to be industrial professionals; (b) prepare students to enter ISEN Ph.D. program in the areas of Human Factors, Systems Engineering, Engineering Management, and Manufacturing. The courses in the program are less quantitative than those in M.S. in INEN. The M.S. in ENSM degree requires 36 hours and is available to Distance Learning students.

The Master of Engineering in Industrial Engineering (M.Eng. in INEN) is a non-thesis option degree and designed to train students to be industrial professionals, and is suitable for students who want to enter industry or are already in industry. The courses in the program are application oriented. The M.Eng. in INEN degree requires 30 hours and is available to Distance Learning students.

A student enrolled in any of these Master’s degrees is required to file a Degree Plan.

THE MASTER’S DEGREE PLAN
The university allows a maximum of 12 hours of transfer credit. However, graduate courses taken at other universities are not automatically transferable. The department’s director of graduate programs in conjunction with the student’s graduate advisory committee will determine if the courses being considered for transfer were taught at an appropriate level and are complementary to the other courses on the degree plan. Also, individual faculty members may have degree requirements beyond those listed below; therefore, you cannot select courses for your degree plan without consulting your graduate advisory committee.

The chair of the advisory committee must be a member of the ISEN graduate faculty. The student’s advisory committee for the Master of Science degree thesis option must have at least two additional members; one member being from outside the ISEN graduate faculty. The advisory committee for the Master of Engineering degree and Master of Science degree non-thesis option do not require additional members. The default advisor for M.Eng. students and
M.S. non-thesis option students is the **director of graduate programs**, though the student may select a different chair if he/she chooses.

Master's students should submit their degree plans **at the beginning of their second semester** (or as soon as 9 hours have been completed, for those attending on a part-time basis, such as some Distance Learning students). Since degree plans are easily changed through petitions, students should not be too concerned about some uncertainty regarding specific courses. **The Office of Graduate and Professional Studies will block students from registering once they have completed 9 hours as a master's degree student without a degree plan on file.**

The ISEN master degree program requirements are listed below under specific degree options. Please also refer to the *Masters' Degrees Checklists* appended to this manual. A number of common rules applying to all the degree options are:

1. At most three hours of ISEN 685 can be used on a degree plan. If the independent study course ISEN 685 is used, a course syllabus of the material to be covered for the semester should be developed and given to the **graduate program coordinator** before registering for the class. A letter grade (not S/U grade) will be assigned at the end of the semester.
2. At most six (6) hours of 400-level undergraduate coursework can be counted towards the degree and these may not be ISEN courses. Any undergraduate courses must first have the approval of the **director of graduate programs**.
3. International students on student visas are required to include two hours of ISEN 684 in a degree plan, although those hours cannot be counted towards a degree requirement. Including ISEN 684 in a degree plan is part of the requirements ISS considers when issuing a Curriculum Practical Training document. If the hours are not used before graduation, they may be removed via a petition.
4. The cross-listed section of ISEN courses (e.g., ISEN/CVEN 642) is considered as an ISEN course.
5. Only the ISEN prefixed special courses, in course numbers of 691, 692, 685, and 684, 681 are counted toward the degree requirement for any graduate degrees in ISEN department. Under special circumstances, when a special course outside ISEN in the aforementioned course numbers needs to be used on a degree plan, prior approval from the **director of graduate programs** must be obtained.
6. In addition to the departmental requirements listed below, a student’s advisory committee may require additional courses.
**MASTER OF SCIENCE DEGREE IN INDUSTRIAL ENGINEERING – THESIS OPTION**

The Master of Science Degree in Industrial Engineering - Thesis option must have at least 32 hours. Each area (Operations Research, Health and Human Systems Engineering, Manufacturing, and System Informatics) has a list of required and elective courses. A student is required to have a meeting and approval from his/her thesis advisor before filing a MS Thesis degree plan. The thesis requirements and final exam options are discussed in the Final Exam section.

The following courses are NOT allowed on a MS INEN degree plan both thesis option and non-thesis option, regardless of the specialty focus:

- CSCE 601, STAT 601, and STAT 651.
- ISEN 620 is not allowed on the same degree plan in which ISEN 622 and ISEN 623 are included.
- STAT 630 is not allowed on the same degree plan in which either STAT 610 or STAT 611 is included.
- As a thesis degree option, ISEN 692 is not allowed. As a non-thesis option, ISEN 691 and ISEN 681 are not allowed.

**OPERATIONS RESEARCH (OR) AREA**

1. **Required courses**
   - ISEN 609 (ISEN 602 can be used to substitute ISEN 609)
   - ISEN 622
   - ISEN 623
   - STAT 610 (STAT 611 can be used to substitute STAT 610)
   - A minimum of two hours of ISEN 691

2. **Elective courses**
   - When both ISEN 609 and ISEN 602 are taken, both courses are counted toward the degree requirement. Under that circumstance, ISEN 602 is an elective course.
   - A total of 18 hours of elective courses are required, of which at most 9 hours can be out of the ISEN department (in addition to STAT 610). No minimum out-of-ISEN hours are required. The 18 hours can ALL be from ISEN, if desired.
   - A maximum of six (6) combined hours of ISEN 691 and/or ISEN 681 is allowed. ISEN 681 is optional, but if used, at most two hours are allowed.

3. **Courses not allowed:**
   - The following courses are NOT allowed in the OR Area in addition to the courses listed above: ISEN 620.
HEALTH AND HUMAN SYSTEMS ENGINEERING (HHSE) AREA

1. Required courses
   - ISEN 630
   - ISEN 631
   - ISEN 635 or ISEN 689 (Special Topics in Biomechanics)
   - ISEN 616 or PSYC 607
   - A minimum of three hours of ISEN691 with a HHSE faculty

2. Elective courses
   - A total of 18 hours of elective courses are required, of which at most 9 hours can be
     out of the ISEN department (in addition to PSYC 607). No minimum out-of-ISEN
     hours are required. The 18 hours can ALL be from ISEN, if desired.
   - A maximum of six (6) combined hours of ISEN 691 and/or ISEN 681 is allowed. ISEN 681 is optional, but if used, at most two hours are allowed.

MANUFACTURING AREA

1. Required courses
   - ISEN 615
   - ISEN 616
   - ISEN 689 (Special Topics in Principles of Manufacturing Processes)
   - ISEN 689 (Special Topics in Measurements and Data Analytics for Manufacturing)
   - A minimum of two hours of ISEN691

2. Elective courses
   - A total of 18 hours of elective courses are required, of which at most 9 hours can be
     out of the ISEN department. No minimum out-of-ISEN hours are required. The
     18 hours can ALL be from ISEN, if desired.
   - A maximum of six (6) combined hours of ISEN 691 and/or ISEN 681 is allowed. ISEN 681 is optional, but if used, at most two hours are allowed.

SYSTEM INFORMATICS (SI) AREA

1. Required courses
   - Students must take four out of the following eight courses: ISEN 609, ISEN 613,
     ISEN 616, ISEN 622, ISEN 623, ISEN 625, STAT 610, STAT 611
   - A minimum of two hours of ISEN691
2. Elective courses

- A total of 18 hours of elective courses are required, of which at most 9 hours can be out of the ISEN department. At most 3 hours can be out of the department if STAT 610 AND STAT 611 are included, and at most 6 hours can be out of the department if STAT 610 OR STAT 611 is included. No minimum out-of-ISEN hours are required. The 18 hours can ALL be from ISEN, if desired.
- A maximum of six (6) combined hours of ISEN 691 and/or ISEN 681 is allowed. ISEN 681 is optional, but if used, at most two hours are allowed.
MASTER OF SCIENCE DEGREE IN INDUSTRIAL ENGINEERING – NON-THESIS OPTION

The Master of Science Degree in Industrial Engineering – Non-thesis option must have at least 36 hours. Each area (Operations Research, Health and Human Systems Engineering, Manufacturing, and System Informatics) has a list of required and elective courses. A final exam is not required for MS non-thesis students.

The following courses are NOT allowed on a MS INEN degree plan both thesis option and non-thesis option, regardless of the specialty focus:

- CSCE 601, STAT 601, and STAT 651.
- ISEN 620 is not allowed on the same degree plan in which ISEN 622 and ISEN 623 are included.
- STAT 630 is not allowed on the same degree plan in which either STAT 610 or STAT 611 is included.
- As a non-thesis degree option, ISEN 681 and ISEN 691 are not allowed.

OPERATIONS RESEARCH (OR) AREA

1. Required courses
   - ISEN 609 (ISEN 602 can be used to substitute ISEN 609)
   - ISEN 622
   - ISEN 623
   - STAT 610 (STAT 611 can be used to substitute STAT 610)

2. Elective courses
   - When both ISEN 609 and ISEN 602 are taken, both courses are counted toward the degree requirement. Under that circumstance, ISEN 602 is an elective course.
   - A total of 24 hours of elective courses are required, of which at most 9 hours can be out of the department (in addition to STAT 610). No minimum out-of-ISEN hours are required. The 24 hours can ALL be from ISEN, if desired.
   - ISEN 692 is optional, but if used, at most three hours of ISEN 692 are allowed.

3. Courses not allowed:
   - The following courses are NOT allowed in the OR Area in addition to the courses listed above: ISEN 620
HEALTH AND HUMAN SYSTEMS ENGINEERING (HHSE) AREA

1. Required courses
   • ISEN 630
   • ISEN 631
   • ISEN 635 or ISEN 689 (Special Topics in Biomechanics)
   • ISEN 616 or PSYC 607

2. Elective courses
   • A total of 24 hours of elective courses are required, of which at most 9 hours can be out of the department (in addition to STAT 610 OR PSYC 607). No minimum out-of-ISEN hours are required. The 24 hours can ALL be from ISEN, if desired.
   • ISEN 692 is optional, but if used, at most three hours of ISEN 692 are allowed.

MANUFACTURING AREA

1. Required courses
   • ISEN 615
   • ISEN 616
   • ISEN 689 (Special Topics in Principles of Manufacturing Processes)
   • ISEN 689 (Special Topics in Measurements and Data Analytics for Manufacturing)

2. Elective courses
   • A total of 24 hours of elective courses are required, of which at most 9 hours can be out of the department. No minimum out-of-ISEN hours are required. The 24 hours can ALL be from ISEN, if desired.
   • ISEN 692 is optional, but if used, at most three hours of ISEN 692 are allowed.

SYSTEM INFORMATICS AREA

1. Required courses
   • Students must take four out of the following eight courses: ISEN 609, ISEN 613, ISEN 616, ISEN 622, ISEN 623, ISEN 625, STAT 610, STAT 611.

2. Elective courses
   • A total of 24 hours of elective courses are required, of which at most 9 hours can be out of the department. At most 6 hours can be out of the department if STAT 610 AND STAT 611 are included, and at most 9 hours can be out of the department if STAT 610 OR STAT 611 is included. No minimum out-of-ISEN hours are required. The 24 hours can ALL be from ISEN, if desired.
   • ISEN 692 is optional, but if used, at most three hours of ISEN 692 are allowed.
MASTER OF SCIENCE IN ENGINEERING SYSTEMS MANAGEMENT

The Master of Science in Engineering Systems Management must have at least 36 hours. The course requirements are in three blocks. A final exam is not required for MS ENSM students.

BLOCK A: Four courses covering systems engineering

1. ISEN 613 (data analytics) [ISEN 619 can be used to substitute ISEN 613]
2. ISEN 625 (simulation)
3. ISEN 640 (system thinking)
4. ISEN 641 (system engineering tools)

BLOCK B: Four courses covering engineering management

1. ISEN 608 (project management)
2. ISEN 663 (engineering management)
3. ISEN 667 (engineering economy)
4. ISEN 669 (engineering decision tools)

BLOCK C: Four elective courses, which can be ALL from ISEN or ALL out of ISEN or any combination of ISEN and out-of-ISEN courses.

The following courses are NOT allowed on a MS ENSM degree plan:

- CSCE 601 and STAT 651
- A student who has taken ISEN 622 and ISEN 623 cannot count ISEN 620 towards their degree requirement.
- STAT 610 or STAT 630 is allowed, but not both.
- ISEN 681 cannot be used towards a degree requirement.
- As a non-thesis degree option, ISEN 691 is not allowed.

ISEN 692 is optional, but if used, at most three hours of ISEN 692 are allowed.
MASTER OF ENGINEERING IN INDUSTRIAL ENGINEERING

The Master of Engineering in Industrial Engineering must have at least 30 hours. The course requirements are in three blocks.

BLOCK A: Four courses covering the breadth of industrial engineering

1. ISEN 601 or ISEN 615 or ISEN 605 (logistics and inventory control)
2. ISEN 614 or ISEN 616 (quality engineering/ design of experiments)
3. ISEN 630 or ISEN 631 or ISEN 635 (human factors)
4. ISEN 667 (engineering economy)

BLOCK B: Three courses covering common modeling techniques and tools

1. ISEN 613 or ISEN 609 or ISEN 619 (data analytics models and tools)
2. ISEN 620 (optimization models and tools)
3. ISEN 625 (simulation models and tools)

BLOCK C: Three elective courses These courses can be ALL from ISEN or ALL out of ISEN or any combination of ISEN and out-of-ISEN courses. When both ISEN 609 and ISEN 613 are taken, both are counted towards the degree requirement. Under that circumstance, ISEN 609 is treated as an elective course.

The following courses are NOT allowed on a Master of Engineering Industrial Engineering degree plan:

- CSCE 601 and STAT 651
- ISEN 622 and 623 can be used to substitute ISEN 620 but once ISEN 622 and 623 are taken, ISEN 620 are then not allowed on the same degree plan.
- STAT 610 or STAT 630 is allowed, but not both.
- ISEN 681 cannot be used towards a degree requirement.
- As a non-thesis degree option, ISEN 691 is not allowed.

ISEN 692 is optional, but if used, at most three hours of ISEN 692 are allowed.

Students may be exempted from the final exam (discussed next) by submitting a petition to the OGAPS and obtaining their committee chair’s and departmental approval (must have a 3.0 GPR).
FINAL EXAM – MASTER’S THESIS STUDENTS

Final exam for MS INEN non-thesis, MS ENSM, and Master of Engineering students are not required. The final exam (also called a comprehensive exam, viva, or oral exam) must be scheduled at least 10 working days prior to taking the exam. It is the student’s responsibility to find an acceptable date and time for the exam by communicating with their committee members. After a time has been agreed upon by the committee members, the student should contact the graduate program coordinator for preparation of the required OGAPS form at least 10 working days prior to the scheduled exam. OGAPS will send the graduate program coordinator notification that the exam is permissible, as well as the form to report the results of the exam. It is also helpful, as a follow-up, for the student to personally remind each committee member of the exam the day before it is scheduled.

Questions during the exam may be over courses on the degree plan (including ISEN 684, 685 or 691) or over material considered prerequisite and basic for all industrial engineers. It is also acceptable for a committee to require the student to give a short presentation over his/her specific area of emphasis, in which case, the committee members should have a report of the presentation before the day of the exam.

A copy of the thesis approved by the chair and in its final form should be available to the committee members two weeks prior to the examination date. We also suggest the student take the copy given to the committee members to the thesis office clerk and have a "rough draft" conference with the thesis clerk. The thesis clerk encourages such conferences, and it is helpful in avoiding problems later. The examination for the thesis option includes a formal presentation of the research and a thesis defense, as well as an examination over the course work. By committee agreement, the final exam for the thesis option may be waived if the student has an overall grade point ratio (GPR) of at least 3.5. The waiver of the final exam is requested via an Office of Graduate and Professional Studies form, provided by the graduate program coordinator. If the exam is waived, a formal presentation of the thesis research is still required; however, the presentation is then in the context of a report of research results instead of an exam.

A student must have a GPR of at least 3.0 over all courses (including 400 level courses) taken during his/her graduate program as well as a 3.0 over the courses on the degree plan in order to take the final exam or to graduate. All courses on the degree plan must have been taken within seven years of the final exam. If the student does not pass the exam, the committee may permit the student to try one more time. If the committee so recommends, the student must take the second exam before the end of the next regular semester.

If circumstances arise such that a committee member cannot attend the exam, the committee member should find another member of the graduate faculty willing to serve as a substitute. Substitutes are almost always permitted if the substitute is 1) a member of the graduate faculty, 2) there will be only one committee member absent, and 3) the absent member is not the chair.
MOVING FROM THE MASTER’S TO THE PH.D. PROGRAM

Students completing a master’s program at Texas A&M University who wish to enter the Ph.D. program must submit a **Letter of Intent** that can be downloaded from the OGAPS website. In addition to the Letter of Intent, the student should also submit a Statement of Purpose, resume or CV, and ask his/her advisory committee members to write letters of recommendation. Students transferring from another department should also ask their department to send a copy of their academic file to the Industrial Engineering Graduate Programs Office. To be accepted into the Ph.D. program, the department requires students to have at least a 3.5 graduate GPR as well as positive letters of recommendation, reasonable GRE scores, and previous academic work consistent with the desire for a Ph.D. in industrial engineering.

Students wishing to transfer from an in-progress master’s program into the Ph.D. program without completing the master’s program should contact the Industrial Engineering Graduate Programs Office.
DOCTORAL DEGREES

There are two types of doctoral degrees that can be pursued at Texas A&M University – the Ph.D. degree and Doctor of Engineering. The Ph.D. degree is described first, followed by a brief description of Doctor of Engineering later in this chapter.

THE PH.D. DEGREE

The Ph.D. degree is a research-oriented degree for students interested in a career in the academic community, in a consulting field, or in an industrial or service organization interested in advanced training. The research interests of the industrial and systems engineering faculty are grouped in four broad areas: advanced manufacturing (MFG), health and human systems engineering (HHSE), operations research (OR), and system informatics (SI).

COURSE REQUIREMENTS COMMON TO ALL FOUR AREAS

NUMBER OF COURSES REQUIRED

Students in both the 64-hour Ph.D. program (Master’s to Ph.D.) and 96-hour Ph.D. program (B.S. to Ph.D.) are required to take no fewer than 11 regular courses, or 33 credit hours, including three credit hours of ISEN 681. This means that for students in the 64-hour degree program, they can use up to 31 hours of ISEN 691, and for students in the 96-hour degree program, they can use up to 63 hours of ISEN 691, towards their degree requirement.

ADVANCED COURSES REQUIREMENT

At least three (3) depth courses on a Ph.D. degree plan should be from a set of advanced graduate courses. A Ph.D. student needs to earn a letter grade of B or better on these courses.

Each of the four research areas shall have a list of graduate courses that the area faculty deems as the advanced course set, furthering a student’s knowledge into sufficient depth of that area. Area faculty should have their advanced course set on file with the ISEN director of graduate programs, so that the ISEN Graduate Program Office can determine that this requirement is satisfied before a Ph.D. degree plan is approved by the department. The advanced course set can be amended by its creating area faculty at any time.

TIMELINE FOR FULFILLING THE COURSE REQUIREMENTS

For the MFG, OR and SI areas, students can complete the common as well as area-specific course requirements at any time during their Ph.D. study.

The HHSE area has its specific timeline requirement on course completion.
COURSES NOT ALLOWED
The following courses will not be allowed on a Ph.D. degree plan:

- All undergraduate courses, except MATH 409, 446 and 447. Other 400-level courses may be permitted in cases where an equivalent graduate-level course is not available, subject to the approval of the director of graduate programs.
- ISEN 620 cannot be included on a degree plan that includes either ISEN 622 or ISEN 623.
- STAT 610 or STAT 630 is allowed, but not both.
- Prerequisite courses: CSCE 601, STAT 601 and STAT 651. The students in the ITDE Ph.D. program (described later) have a different set of required courses.

PH.D. STUDY TIMELINE
There are a few examinations (milestones) and deadlines that exist in the Ph.D. study timeline. These are illustrated in Figure 1 below. Please review these milestones and discuss them and your plan with the chair of your advisory committee. The milestones are discussed next.

FIGURE 1. PH.D. STUDY TIMELINE AND MILESTONES.

THE QUALIFYING EXAMINATION PROCEDURE
The first step towards successfully completing the doctoral studies is to pass the qualifying examination. Each area has developed a qualifying procedure, and the chair of the advisory committee will recommend the student the most suitable area-specific qualifying procedure based on the student’s doctoral research plans and direction. In the qualifying procedure, a faculty committee is involved in the administration, evaluation and decision on the final outcome.
FACTORS CONSIDERED IN THE DECISION OF QUALIFYING PROCEDURE AND THE OUTCOME TO BE COMMUNICATED

The faculty committee may consider the following factors in making the decision: coursework performance, research potential, and scholarly accomplishments (if any). The qualifying procedure itself may help measure one or more aspects of the above factors.

A student will receive a single outcome that represents the collectively-voted decision of the faculty committee. No further breakdown of scores will be provided.

AREA-SPECIFIC COURSE REQUIREMENTS AND QUALIFYING PROCEDURE

HEALTH AND HUMAN SYSTEMS ENGINEERING (HHSE) AREA

- Course Requirements
  - All HHSE Ph.D. students are required to take at least two of the following courses: ISEN 616, ISEN 631, ISEN 640.
  - All HHSE Ph.D. students must take the required courses in the first and second semesters of their enrollment, and must score a grade of B or better on each course.
  - HHSE Ph.D. students must fulfill the same Advanced Course Requirement listed under the common requirement section, but need to complete the requirement prior to taking the preliminary exam.

- Qualifying Procedure
  - Table 2 outlines the process of the HHSE qualifying procedure and its associate timeline. In the first semester of the first year, all HHSE Ph.D. students will receive formal instruction in conducting a systematic literature review. This formal instruction is conducted via a 1-3 credits ISEN 691, or via other university resources, such as modules offered by the TAMU libraries system or online sources.
  - Each student will be associated with a first year faculty mentor, normally the Ph.D. advisor but in some cases it may be another HHSE faculty. This mentor will assist the student in the identification of a research problem area and potentially help in the initial stages of literature search. Students must have a named advisor by the time they conduct the oral exam (final step in the Qualifying procedure).
  - All tenured and tenure-track faculty who identify with the HHSE area will take part in the assessment and decision process. If a faculty member does not identify with the HHSE focus area, but is the primary advisor to a Ph.D. student who wishes to follow the HHSE procedure, that faculty member must also participate in the qualifying procedure assessment activities for that student and act as a voting member in the evaluation process.
  - All evaluating members (all HHSE faculty + non-HHSE advisors for specific students) will be responsible for contributing to initial and final reviews of student reports, with a roughly even workload distribution.
  - All HHSE students will have at least two, and ideally three HHSE faculty critically review their reports. One reviewer must be the student’s Ph.D. advisor/first-year
TABLE 2. HHSE QUALIFYING PROCEDURE

<table>
<thead>
<tr>
<th>Step</th>
<th>Step Description</th>
<th>Semester</th>
</tr>
</thead>
</table>
| 1    | Identify topical area  
      • Identify domain and context  
      • Define research questions | Fall 1 |
| 2    | Conduct literature review and assessment  
      • Learn systematic review process  
      • Learn critical literature assessment process  
      • Initial literature collection and review  
      • Narrow topical area for systematic review  
      • Perform systematic review and critical literature assessment | Spring 1 |
| 3    | Prepare report consisting of  
      i. Executive summary  
      ii. Documented systematic review process  
      iii. Documented critical assessment process  
      iv. Critical literature review  
      v. Proposed research problem  
      vi. Research Timeline  
      vii. References | Summer 1 |
| 4    | Submit report and iterate  
      • Submit report (September 1)  
      • Receive feedback (October 1)  
      • Resubmit report (December 1) | Fall 2 |
| 5    | Oral defense | Spring 2 (Jan 15) |

**Decision:**
I. Pass: student advances to next preliminary phase
II. Pass with condition: student satisfies condition in Spring 2
III. Fail: student finishes terminal masters by end of Spring 2

Faculty mentor. At least one reviewer must be another HHSE faculty member that has not conducted research activities with the student. Review assignments can be discussed/negotiated among the HHSE faculty, with the HHSE area convener making final decisions regarding review assignments.

- All evaluating members will be present for the oral exam of students in the week before the start of the Spring semester. These oral exams will be scheduled with students in Fall prior to the holiday break.
- Immediately following each oral exam, the HHSE faculty (or non-HHSE members of the student’s committee) will hold closed meetings to evaluate each student individually.
- At the conclusion of each student evaluation, each HHSE faculty member (or non-HHSE members of the student’s committee) will submit an outcome vote for the student of Pass, Pass with conditions, or Fail. No retake is allowed. The student must receive a majority vote of “pass” and “pass with conditions” votes in order to pass the procedure. The evaluating committee must have a majority agreement to give an outcome of Pass with conditions, as well as majority agreement about what those conditions will be and how/when they will be assessed.
• For students arriving in a spring semester, they will be assessed by the same rules and but on a timeline that starts in the semester of arrival.
  o The HHSE area convener is responsible for coordinating the HHSE area qualifying procedure and reporting the final decisions to the ISEN Graduate Program Office.

**Manufacturing (MFG) Area**

• Course Requirements
  o Four required courses: ISEN 615, ISEN 616, ISEN 689 (Special Topics in Principles of Manufacturing Processes) and ISEN 689 (Special Topics in Sensing and Prognostics Manufacturing).
  o Students need to score a grade of B or better on each course.

• Qualifying Procedure
  o A student must have a named advisor to initiate the qualifying procedure.
  o The student’s advisor chooses two other faculty members to form an examination committee. Two out of the three committee members must be from the MFG area. The advisor is the default chair of the committee but the committee can choose to elect a different chair.
  o The qualifying procedure shall consist of a one-week take home exam. Each committee member will contribute one third of the exam.
  o Exam questions will be open-ended research questions.
  o At the end of the one-week exam period, the student shall submit his/her answers to the chair of the committee. The committee shall evaluate the student collectively.
  o The outcome of the written exam can be: Pass, Fail, or Conditional Pass. In case of a “Conditional Pass” grade, the committee will hold an oral exam to the student within two weeks. The final outcome of the qualifying exam is Pass or Fail.
  o The committee chair shall notify the ISEN Graduate Program Office about the final outcome of the qualifying exam.
  o The qualifying procedure can take place after the first semester of full-time enrollment in ISEN Ph.D. program, but shall be no later than the beginning of his/her fourth regular semester. More specifically, the examination committee’s decision must be made no later than the fifth class day of the fourth regular semester of the student, so in the case that the student fails the qualifying procedure, he/she can still adjust his/her coursework in order to exit the ISEN graduate program with a master’s degree.

**Operations Research (OR) Area**

• Course Requirements
  o Four required courses: ISEN 602, ISEN 622, ISEN 623, and STAT 611.
Students are required to take at least two courses outside the OR area. The following courses are considered the OR area courses: ISEN 602, 609, 611, 618, 620, 621, 622, 623, 624, 627, 628, 629, 636, 637, 638, 661, and 668.

- Students need to score a grade of B or better on each course.

Qualifying Procedure
- The qualifying exam will be based on three courses (ISEN 602, 622, 623) and must be taken in one installment within a year of entering the Ph.D. program.
- The exam is offered at the end of each Spring and Fall semester, whenever there is a demand.
- All OR faculty will collectively decide on the outcome of examination for each student.
- There are three possible outcomes: pass, conditional pass, and fail. No retakes will be allowed.
- The students who fail the exam will be allowed to complete MS or ME degree.
- The OR area convener is responsible for coordinating the OR area qualifying exam and report the final decisions to the ISEN Graduate Program Office.

**SYSTEM INFORMATICS (SI) AREA**

- Course Requirements
  - Students in the SI area need take four of the following eight courses, making a grade of B or better on each course: ISEN 602, ISEN 609, ISEN 616, ISEN 622, ISEN 623, ISEN 625, STAT 610, and STAT 611.
  - Students can use the courses from the SI advanced course set to replace the required courses that share the same course prefix (namely ISEN for ISEN, STAT for STAT). The total number of required courses and advanced courses must remain no fewer than seven (four required and three advanced).
  - SI students need to take two courses outside the SI area. The following courses are considered the SI area courses: ISEN 612, 613, 614, 616, 619, 625, and 662.

- Qualifying Procedure
  - A student must have a named advisor to initiate the qualifying procedure.
  - The student’s advisor chooses two other faculty members to form an examination committee. At least two of the three members must be from the SI area. If the advisor is from this area, one of the examination committee members can be from outside the SI area. But if the advisor is outside this area, the other two members must from the SI area. The advisor is the default chair of the committee but the committee can choose to elect a different chair.
  - Each member examines the student in a format of their choosing. But it must have a written exam part, followed by an oral exam part that is conducted by the whole three-person committee.
The default form of the written exam is to let student work on open-ended question(s) in one week duration prior to the oral exam. But if an examiner so chooses, he/she can give an in-classroom exam lasting two to three hours.

Multiple students taking the qualifying exam at the same time can share the same examination committee.

At the end of the oral exam, the examination committee makes the final decision based on the majority votes of the committee.

The committee’s decision can be: pass, conditional pass, or fail. Unless under extenuating circumstances, retake is not allowed.

The committee chair shall notify the ISEN Graduate Program Office about the final outcome of the qualifying exam.

The qualifying procedure can take place after the first semester of full-time enrollment in ISEN Ph.D. program, but shall be no later than the beginning of his/her fourth regular semester. More specifically, the examination committee’s decision must be made no later than the fifth class day of the fourth regular semester of the student, so in the case that the student fails the qualifying procedure, he/she can still adjust his/her coursework in order to exit the ISEN graduate program with a master’s degree.

**Ph.D. Degree Plan**

Students are expected to submit their degree plan by the first regular semester after the qualifying procedure has been satisfied. The chair of the advisory committee must be a member of the ISEN graduate faculty. A co-chair, if desired, may be from ISEN or from another department. The Ph.D. committee has a minimum of four graduate faculty members on the original degree plan with at least one from outside the department.

A Ph.D. degree for a student with a master's degree requires at least 64 hours, and no courses counted for credit toward the master’s degree can be included in the 64 hours. Up to 12 credit hours of courses may be transferred to a Ph.D. degree plan if the advisory committee feels they aid in the academic objectives of the degree. At most three hours of ISEN 685 can be used in the category of regular course hours.

The *Office of Graduate and Professional Studies* will place a registration block on Ph.D. students after 36 hours have been completed if no degree plan has been filed.

**Preliminary Examination**

The preliminary exam may be scheduled when there are no more than six hours of course work remaining on the degree plan (excluding 681, 684, 691 courses). Students must complete the preliminary exam no later than the end of the semester after completion of all the course work on the degree plan (excluding 681, 684, 691 courses). The *Office of Graduate and Professional Studies* must receive the results of the preliminary examination at least one semester prior to the final exam date. The *Office of Graduate and Professional Studies* intends to monitor and enforce the preliminary examination scheduling of students within the stated earliest and latest times.
The exam can consist of a written portion given by each member of the advisory committee and/or an oral portion. The committee reserves the right to waive the written portions. The oral examination component is required. The student should contact the graduate program coordinator (ETB 4060) to process the necessary paperwork for the exam. A form needs to be signed by the committee chair and the director of graduate programs when fixing the schedule and a memo will be prepared formally notifying the committee of the dates and times for the exam. The time between the first written exam and the time of the oral exam is at least 3 weeks or 15 working days. Deviations from this timeline need prior approval by the Director of Graduate Program. It is also helpful, as a follow-up, for the student to remind each committee member about the exam the day before it is scheduled.

A student must have a GPR of at least 3.0 over all courses (including 400 level courses) taken during his/her graduate program as well as a 3.0 over the courses on the degree plan in order to take the exam. All requirements for the Ph.D. must be completed within four years of the exam, or the preliminary exam will have to be retaken. (This four-year limit is measured from the time when the oral preliminary exam is passed to the time when the thesis clerk in the library approves the dissertation.)

There are three possible outcomes of the preliminary examination:

1. The student passes,
2. The student passes but some additional requirements are added to the student’s program to overcome a weakness uncovered during the exam, or
3. The student fails.

If the exam is failed, it can be repeated one time, with the advisory committee’s recommendation. All portions of the written exam must be passed before the oral exam is administered.

If circumstances arise where a committee member cannot attend the exam, the committee member should find another graduate faculty member willing to serve as a substitute. Substitutes are almost always permitted as long as there will be only one committee member absent, and the member absent is not the chair.

If the preliminary exam is combined with the proposal presentation (described in the next section), then the approved proposal must be submitted to the Office of Graduate and Professional Studies at least 14 weeks prior to the date of the Final Examination (for which request paperwork is submitted 2 weeks/10 working days prior to the exam itself).

The Proposal Presentation

The proposal presentation is the penultimate milestone towards completing the doctoral studies (refer to Figure 1). The industrial and systems engineering department requires a formal presentation of the proposal. The proposal presentation can take place after the student has passed the preliminary exam, but at the discretion of a student’s advisory committee, students can take the oral portion of the preliminary exam and proposal presentation at the same time. The proposal presentation serves three functions: (1) it helps to educate the student in the art of making professional presentations; (2) it provides an opportunity for the committee to determine if the student has enough knowledge to pursue research in the proposed subject area; and (3) it
allows the committee to pass judgment on the suitability of the proposed research as a dissertation topic.

**A proposal presentation must be scheduled at least two weeks prior to the time of the meeting. A complete written draft of the proposal must be provided to the committee at least two weeks prior to the proposal presentation.**

If the proposal presentation takes place after a student has passed his/her preliminary exam, the non-departmental members of the committee are not required to attend the proposal presentation, but they should be invited. Under all circumstances, all committee members must sign the proposal before it goes to the Office of Graduate and Professional Studies. The approved proposal must be submitted to the Office of Graduate and Professional Studies at least one semester prior to the submission of the Request for the Final Examination (which is submitted 10 working days prior to the exam itself). If the preliminary exam and proposal are taken at the same time, then the one semester minimum requirement before the Final Exam must be followed (see previous section covering Preliminary Exam).

The cover sheet and guidelines for the proposal may be obtained from the OGAPS website.

**Publication of Research**

Work leading to the Ph.D. is designed to give the candidate thorough and comprehensive knowledge of the chosen professional field and training in research methods. With the help of the student's advisory committee, the student is expected to prepare a paper (or papers) for submission to a professional journal before the final defense. In addition to successfully completing the degree plan coursework, students are expected to present their dissertation research in an ISEN 681 seminar, INFORMS or HFES student chapter seminar, or at a national conference.

**The Final Exam**

The final exam (also called the final defense or, simply, the defense) for a Ph.D. student includes an open (public) presentation of research results and a closed examination of the dissertation. The final exam needs to be scheduled and copies of the dissertation -- approved by the chair -- must be provided to the committee at least two weeks before the exam. The copies of the dissertation given to the committee should be the final form. It is also a good practice to keep the committee informed of your research progress so that guidance is provided continually instead of as a surprise during the final exam. We also suggest that the student take a copy of the dissertation given to the committee to the thesis office in the library and have a rough draft conference with the thesis clerk. The thesis clerk encourages such conferences, and it is usually very helpful in avoiding problems later on. It is the student's responsibility to find an acceptable time for the committee to meet. After a time has been agreed upon by the committee members and a meeting place determined, the student should contact the graduate program coordinator for preparation of the final examination paperwork at least 2 weeks or 10 business days before the scheduled defense. The graduate program coordinator will also prepare an announcement for the public presentation. OGAPS will send the graduate program coordinator notification that the exam is permissible and will include the form that must be returned after the exam. Since the final exam includes the formal public presentation of the dissertation research, it must be publicized.
throughout the department. It is also helpful, as a follow-up, for the student to remind each committee member about the exam the day before it is scheduled.

The final exam usually lasts two hours. It is the chair's responsibility to encourage questions and ensure that the presentation is conducted in a professional manner. A common practice is for the chair to introduce the topic and the student as would be done at a professional conference. It is also a good practice for the student to prepare a presentation that lasts 30 to 40 minutes to allow time for questions. After the presentation, the committee meets in private with the student for the dissertation defense.

A student must have a GPR of at least 3.0 over all courses (including 300 and 400-level courses) taken during his/her graduate program as well as a 3.0 in the courses on the degree plan in order to take the exam. All courses on the degree plan must have been taken within 10 years of the final exam. Also, the dissertation must be accepted by the thesis clerk in the library within one year of passing the final exam.

If circumstances arise such that a committee member cannot attend the exam, the committee member should find another graduate faculty member willing to serve as a substitute. Such requests are almost always permitted as long as there will be only one committee member absent and the member absent is not the chair.

**DOCTOR OF ENGINEERING PROGRAM**

Students who prefer an industry-oriented doctoral degree, instead of a research oriented degree, should consider the D.Eng. program which is administered through the Office of the College of Engineering. Students interested in the D.Eng. degree must be admitted first into a Ph.D. program and find a faculty member who will direct their committee. Students who fail the departmental qualifying exam are not eligible to transfer into the D.Eng. program. Information describing the Doctor of Engineering Degree can be obtained from the Engineering Academic and Student Affairs Office.

**INTERDISCIPLINARY Ph.D. DEGREE**

The Doctor of Philosophy (Ph.D.) degree in Interdisciplinary Engineering (ITDE) was created to accommodate outstanding engineering students whose research interests cross engineering disciplines and/or college lines. Examples of previously awarded interdisciplinary topics include environmental engineering and public policy; and engineering and education.

A student applying to the Ph.D. program in ITDE must be a current Ph.D. student in a department within the College of Engineering. The ITDE program is administratively housed in the College of Engineering under the associate dean. Program information describing the Interdisciplinary Ph.D. Degree can be obtained from the Engineering Academic and Student Affairs Office.
CHAPTER 5

FINANCIAL ASSISTANCE

There are four types of financial aid available to graduate students in industrial and systems engineering: fellowships, departmental assistantships, faculty research assistantships, and scholarships. To receive financial aid, students must be enrolled as full-time students. Faculty research assistantships are under the control of faculty members who have obtained research grants. The other three forms of financial aid are initiated within the department, are highly competitive, and based primarily on the student’s academic credentials. Departmental assistantships are only available to industrial and systems engineering graduate students.

The primary indicators for financial aid consideration of prospective students are the selection of previous courses taken and their associated grades, the reputation of the previous school, previous research work, the ability to help the department with its academic responsibilities, and letters of recommendation with strong preference given to students in the Ph.D. program. The GRE-verbal and TOEFL scores are also used as primary indicators of English language proficiency for a student who is a graduate of a foreign institution of higher education. Other scores from the GRE tests may be used as secondary indicators. Nominations for college and university fellowships are made using the same measures.

FELLOWSHIPS

The university and college offer several types of fellowships, and nominations of all qualified students are made automatically by the department. Fellowships are the most prestigious of the various forms of financial aid. Fellowships are primarily designed as a recruiting tool and are usually available only to new students.

SCHOLARSHIPS

The department has a limited number of $1,000 per year scholarships given to qualified students. (These scholarships also include a waiver of out-of-state fees for the academic year so the recipients pay only in-state tuition and fees.) As with other forms of financial aid, they are awarded on a competitive basis according to the academic credentials of the students. The scholarships are given for one academic year only and are extended based on the same competitive basis as the original award.

ASSISTANTSHIPS

Graduate assistantship positions require an average of 20 hours of work per week. Since most departmental assistantships are given to new students, the actual assignments are not made until the first day of classes and are based on the department’s academic needs. Thus, when a student receives an offer of a departmental assistantship, it is usually not known whether it is for teaching, non-teaching, or research until the beginning of the semester. When the assignment for the semester is made, the student will be assigned to work under the supervision of a faculty member. During the first week after assignments have been made, the student should make an appointment
with his/her faculty supervisor to determine the semester’s work schedule. Since the assistantship is provided to the student for work to be performed, in some instances, the project work may not relate to the student’s research topic; thus, a graduate assistant must fully understand his/her dual role as a student and as an employee.

The university has a policy that a student with teaching responsibilities must attend an all-day teaching workshop conducted by the University Center for Teaching Excellence. Students may be asked to attend this workshop in preparation for future assignment possibilities. In addition, state law requires that a student whose native language is not English must be certified in English proficiency before being assigned any teaching function (certification is discussed in the “English Language Proficiency” section). Additional discipline-related training may be required.

**EVALUATION OF GRADUATE ASSISTANTS**

At the end of each semester, the performance of all graduate students supported by departmental funds (both research and teaching assistants) will be evaluated.

For teaching assistants, this evaluation may consist of:

1. Student evaluation forms, if appropriate (e.g. for TAs with lab sections).
2. An assessment of work performance by the student’s supervisor.
3. An assessment of the student’s academic progress by the chair of the student’s degree committee (if applicable) or by the director of graduate programs (if the student has not yet filed a degree plan).

For research assistants, the evaluation is primarily based on an assessment of academic progress by the student’s academic supervisor. If the student’s academic progress or the performance on his/her assigned tasks is deemed inadequate, the graduate program director may recommend that departmental funding be discontinued.

**INSURANCE AND BENEFITS**

Students with a departmental assistantship or a faculty research assistantship which requires 20 hours per week are considered half-time employees. As such, they are entitled to medical insurance benefits, and the university contributes towards the insurance after the first 60 days has elapsed. Students should contact the business administrator to enroll in the insurance program. All students are required to have some form of health insurance coverage, and, depending on visa status, may be required to provide proof of coverage for all dependents.
MISCELLANEOUS POLICIES

POLICY REGARDING ISEN 681

ISEN 681 is a one-hour seminar course in which guests give presentations about topics of professional interest to industrial engineers. There are usually guests from outside the university making presentations each semester as well as many of the department faculty. Ph.D. students also present their research, usually during their final semester; thus, the seminar is an excellent means for other students to keep abreast of the research activities with Industrial Engineering. The seminar series is meant to be used by M.S. Thesis students and Ph.D. students as an avenue to familiarize themselves with research; therefore, Ph.D. students are required to register for the seminar for at least three semesters. M.S. students are encouraged to register but not required. The M.Eng. and M.S. ENSM programs are not intended as research degrees and, therefore, seminars will not be counted for those degrees. Thus, students that are admitted to the M.S. in IE program and subsequently file an M.Eng. or ENSM degree plan will not be allowed to use the 681 hours that they have accrued. (Note that B.S. to Ph.D. students that file a M.Eng. degree plan to receive a Master’s degree during the extended Ph.D. process will apply their seminar credits to the Ph.D. degree and not use them during the M.Eng. process.)

POLICY REGARDING ISEN 684

ISEN 684 is an industrial internship allowing graduate students to apply their course work to an industrial problem. When students are on an internship, there must be an academic component to their work assignment that has been discussed with their advisor before registering for the course. At the end of the course, the student will deliver a written final report describing his/her experience, activities, and findings. The report should be similar in style and content to an internal company project report, and a grade of “S” or “U” will be given. A student may combine ISEN 684 and ISEN 692 or ISEN 691 hours at the discretion of the student’s committee and use the 692 or 691 hours to finish on campus a project started in industry. At the discretion of the advisor, an incomplete grade (“I”) may be given for the 684 until after the 692 project or 691 research is complete. The continuous registration requirement applies to ISEN 684 as well as to ISEN 691 and 692.

International Master’s level students are only allowed 2 credits of ISEN 684. This means that a student can go on internship for no more than 2 semesters (Fall, Spring, or Summer. Any combination is fine, but no more than 2). International PhD students are allowed up to 3 credits of ISEN 684. Students must comply with all other DHS/ISS rules concerning the duration and nature of CPT employment.

A student must have available/unused ISEN 684 credits already in place on an approved official degree plan before he/she will be allowed to file CPT paperwork or extension paperwork. This requirement is stated on the degree plan checklists for all degree plans. If a student does not have
the credits listed on the degree plan as required, the graduate programs office will not complete
the CPT paperwork.

Students should be in good academic standing before attempting to take an internship or continue
with an internship (this is defined as a cumulative GPA of at least 3.0).

If a student will be graduating during the semester in which he/she is going for an internship, the
graduate programs office needs to know this in advance (at the time of CPT paperwork filing). This is because additional paperwork must be completed to ensure that the student remains in
status. The student **MUST** decide whether he/she will be graduating during the semester of the
internship; there **cannot** be any indecisiveness or changing of mind midway through the semester.

If a student has been given an internship offer, the graduate programs office needs the following
paperwork to be completed before completing the departmental paperwork:

- Official offer letter with start and end dates listed,
- Employer CPT form (filled out by employer’s representative; found on ISS website),
- Student CPT (filled by the student).

The graduate programs office will not be able to complete the departmental paperwork without
these items. **All CPT paperwork is due in the graduate program office no later than 10
business days prior to the proposed start date or the last working day before classes
begin, whichever comes first.**

**POLICY REGARDING ISEN 685**

ISEN 685 is a directed-study course designed to cover special topics not within the scope and
format of thesis research or covered by another formal course currently offered in the curriculum. Therefore, the student must submit to the ISEN **director of graduate programs** a syllabus
approved by the directing faculty member before enrolling in ISEN 685. The syllabus should
provide a detailed description of the topic, list the resource material(s) to be used, identify the
course deliverables, outline the method of evaluation, and list the number of credit hours
assigned. At the end of the semester, a letter grade (i.e., other than S/U) should be assigned. A
grade of I is appropriate only for medical reasons or for similar unforeseen circumstances.
Depending on the topic chosen, it may not be appropriate for a student to take all planned credits
in the same semester. In such cases, the total number of planned credits can be staged over more
than one semester.

**POLICY REGARDING ISEN 691**

ISEN 691 is used for faculty-directed research leading to a thesis or dissertation, and may not be
used by students in the **Master of Science in Industrial Engineering Non-thesis**, **Master of Science
in Engineering Systems Management**, or **Master of Engineering** degree programs. The number
of hours taken each semester should be proportional to the level of faculty and institutional
support. Exceptions to this policy are (1) the student registers **in absentia** (i.e., the student is
living outside of the College Station/Bryan area and will not be using university facilities), and (2)
the student’s final exam has already been scheduled for the first month of the semester. Note that
grades of “I” may be carried over until the final exam, and the final grade is either an “S” or “U.” Also, the university’s continuous registration policy requires that if the coursework on the degree plan is complete except for ISEN 691, the student must be registered each regular semester until graduation.

**POLICY REGARDING ISEN 692**

ISEN 692 is used for faculty-directed research and/or project work for a non-thesis degree. At the end of the course, the student will submit a written report covering the research and project work. The report should be similar in style (but not necessarily content) to a thesis. The number of hours taken each semester should be proportional to the level of faculty and institutional support. Exceptions to this policy are (1) the student registers in absentia (i.e., the student is living outside of the College Station/Bryan area and will not be using university facilities), and (2) the student’s final exam has already been scheduled for the first month of the semester. Note that grades of “I” may be carried over until the final exam, and the final grade is either an “S” or “U.” Also, the university’s continuous registration policy requires that if the coursework on the degree plan is complete except for ISEN 692, the student must be registered each regular semester until graduation.

**COURSE LOAD DURING A SEMESTER**

A graduate student is expected to enroll in 9 credit hours during a regular semester (Fall and Spring) to maintain full time status. This is equivalent to three courses in the semester, or two courses with research (ISEN 691), project (ISEN 692), and/or seminar (ISEN 681) credits. It is strongly recommended that a student enrolls in 9 credit hours during the semester as this requires a good amount of time outside of the classroom every week to keep up with the coursework. Enrollment in up to four courses is allowed, but not recommended. If a student enrolls in more than four courses in a semester, the graduate program office may hard drop the student from ALL course enrollments and then will place the student under an academic hold until the start of that semester.

New students are allowed to register for at most 9 credit hours in their first semester in the program.

**Q-DROP POLICY**

At most one Q-drop is allowed for students in the master’s program, and at most one Q-drop is allowed for students in the Ph.D. program, with the following exceptions:

1. Q-drops before the 12th class day of a regular semester or 4th class day for the summer are not considered as part of the limit. (This is 12 days into the semester, not 12 days of the course.)
2. If a degree plan has been filed before the semester starts, Q-drops for courses not on the degree plan will not count against the limit if the advisory committee chair requests the exception.
3. Q-drops for other extenuating circumstances will be considered on a case-by-case basis.
PROBATION FOR GRADUATE STUDENTS

A student in the Ph.D. program is placed on probation when his/her cumulative GPR is below 3.0. If a student on probation has a semester with a semester GPR lower than 3.0, then he/she will be removed from our Ph.D. program.

Students in the master’s programs are subject to periodic reviews by the ISEN Graduate Committee. Students will be placed on probation, and could be subsequently removed from our graduate programs, if the Graduate Committee does not believe that the student has a reasonable chance of graduating from our program with a degree.

TRAINING AND SAFETY

From time to time, the university may assign graduate students to undergo training on different aspects as part of ensuring compliance with university, state and federal laws. Examples include training on ethics, ethical code of conduct while conducting research, safety, IT, etc. Students are required to complete the assigned training in a timely manner, and follow the procedures and regulations that were discussed during the training process. Failure to comply with the required procedures and regulations could potentially lead to unsafe or compromised situations, and may result in strong consequences.

POLICY REGARDING ACADEMIC DISHONESTY

The ISEN department takes academic misconduct very seriously. The department has adopted the Academic Integrity Statement, which is stated below.

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: http://student-rules.tamu.edu/; http://student-rules.tamu.edu/aggiecode; and http://student-rules.tamu.edu/rule20. The complete information of university regulations regarding the handling of academic misconducts (including the appeal process) can be found at http://aggiehonor.tamu.edu/.

The Industrial & Systems Engineering Faculty upholds the Aggie Honor Code as an axiom of our academic excellence. The ISEN faculty considers its sincere observance to be essential for membership in the department and Texas A&M. The department extends the students the trust conferred to those who faithfully adhere to our honor code. Abuse of this trust is intolerable, thus will be promptly reported and assigned an extreme penalty to those who do not stand with the faculty in preserving the integrity symbolized by the Aggie Honor Code, “An Aggie does not lie, cheat, or steal or tolerate those who do.”

In an ISEN course the penalty for any violation of the Aggie Honor Code, as minimal as it may be, is F*.
APPENDIX

To help in filling out a degree plan, checklists have been designed by which students can verify that departmental requirements have been satisfied. Copies of the checklists are located on the department’s webpage and in the ISEN Graduate Program Office.
MASTER OF ENGINEERING IN IE DEGREE CHECKLIST

Instructions: The purpose of this checklist is to help you insure that your degree plan satisfies university and departmental policies. Additional university requirements can be found through the OGAPS website.

A. **Required Breadth Courses**: 12 hours
   (i) ISEN 601 _____ – or – ISEN 615 _____ – or – ISEN 605 _____
   (ii) ISEN 614 _____ – or – ISEN 616 ______
   (iii) ISEN 630 _____ – or – ISEN 631 _____ – or – ISEN 635 _____
   (iv) ISEN 667 ______

B. **Required Modeling Technique and Tool Set Courses**: 9 hours
   (v) ISEN 613 _____ – or – ISEN 609 _____ – or – ISEN 619 ______
   (vi) ISEN 620 ______
   (vii) ISEN 625 ______

C. **Elective Courses**: 9 hours (These can be graduate courses taken either from ISEN or any other department. ISEN 692 is optional, but if used, may be used up to a maximum of 3 hours. ISEN 685 is optional, but if used, may be used up to a maximum of 3 hours.)

   __________               __________               __________

D. **International Students Only**:
   Industrial internship - ISEN 684: 2 hrs, 1 hr per semester ______
   (2 hours are required to be included in the degree plan for administrative purposes, but students are not required to use them. If used, does not count towards the minimum degree requirements of 30 hours. If not used, they will be removed before graduation.)

Notes:
1. A non-thesis degree requiring at least 30 hours.
2. 691 is not allowed and 681 hours will not count towards a degree requirement.
3. Graduate courses NOT allowed: CSCE 601 and STAT 651.
4. Generally, no undergraduate courses may be on degree plan. But with prior approval of ISEN Graduate Program Director, up to 2 non-ISEN undergraduate (400-level) courses may be used.
5. ISEN 620 may be used with ISEN 622 or ISEN 623 but not both; STAT 630 and 610 may not be on the same degree plan.
6. The cross-listed sections of ISEN courses (e.g., ISEN 642) are considered as ISEN courses.
MASTER OF SCIENCE IN IE DEGREE CHECKLIST

Instructions: The purpose of this checklist is to help you insure that your degree plan satisfies university and departmental policies. Additional university requirements can be found through the OGAPS website.

A. Required Courses: 12 hours

<table>
<thead>
<tr>
<th>HHSE Track</th>
<th>MFG Track</th>
<th>OR Track</th>
<th>SI Track (Pick 4 from list)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISEN630</td>
<td>ISEN615</td>
<td>ISEN622</td>
<td>ISEN609</td>
</tr>
<tr>
<td>ISEN631</td>
<td>ISEN616</td>
<td>ISEN623</td>
<td>ISEN613</td>
</tr>
<tr>
<td>ISEN635 or 689</td>
<td>ISEN689 (PMP)</td>
<td>STAT610</td>
<td>ISEN616</td>
</tr>
<tr>
<td>ISEN616 or PSYC607</td>
<td>ISEN689 (SPM)</td>
<td>ISEN602 or 609</td>
<td>STAT610</td>
</tr>
</tbody>
</table>

B. Elective Courses: at least 24 hours for non-thesis option, at least 20 hours for thesis option

(At most, 3 courses/9 hours may be taken from non-ISEN departments. ISEN 685 is optional, but if used, may be used up to a maximum of 3 hours. ISEN 692 is also optional, but if used, may be used up to a maximum of 3 hours, for non-thesis option students only.)

________                     ________                       ________                        ________
________                       ________                       ________                        ________

C. Thesis Option Students Only: ISEN 691** (2-6 hrs) __ ISEN 681 (0-2 hrs) __

(**At least 2 hrs of ISEN 691 are required. ISEN 681 is optional. The total number of combined ISEN 681 and 691 hours cannot exceed 6. At least 2 hours of ISEN 691 are in addition to the ISEN elective hours above in part B.) Thesis proposal required.

D. International Students Only:

Industrial internship - ISEN 684: 2 hrs, 1 hr per semester ________

(2 hours are required to be included in the degree plan for administrative purposes, but students are not required to use them. If used, does not count towards the minimum degree requirements of 32 or 36 hours. If not used, they will be removed before graduation.)

Notes:
1. Thesis option: at least 32 hours; Non-thesis option: at least 36 hours.
2. Graduate courses NOT allowed: STAT 601, CSCE 601, STAT 651, and ISEN 620. STAT 630 or 610 may be used, but not both.
3. For non-thesis option, ISEN 681 hours will not count towards a degree requirement. ISEN 691 is not allowed on a non-thesis degree plan.
4. Generally, no undergraduate courses may be on degree plan. But with prior approval of ISEN Graduate Program Director, up to 2 non-ISEN undergraduate (400-level) courses may be used.
5. The cross-listed sections of ISEN courses (e.g., ISEN/CVEN 642) are considered as ISEN courses.
MASTER OF SCIENCE IN ENSM DEGREE CHECKLIST

Instructions: The purpose of this checklist is to help you insure that your degree plan satisfies university and departmental policies. Additional university requirements can be found through the OGAPS website.

A. Required Systems Engineering Courses: 12 hours
   (i) ISEN 613 _____ – or – ISEN 619 _____ – or – ISEN 609 _______
   (ii) ISEN 625 _____
   (iii) ISEN 640 _____
   (iv) ISEN 641 _____

B. Required Engineering Management Courses: 12 hours
   (v) ISEN 608 _____
   (vi) ISEN 663 _____
   (vii) ISEN 667 _____
   (viii) ISEN 669 _____

C. Elective Courses: 12 hours*
   (These can be graduate courses taken either from ISEN or any other department. ISEN 692 is optional, but if used, may be used up to a maximum of 3 hours. ISEN 685 is also optional, but if used, may be used up to a maximum of 3 hours.)

__________________          __________          __________          __________

*Suggested: use these elective courses to earn a certificate from another department with no additional time or money investment. Example: Business Certificate - ACCT 640, FINC 635, MGMT 655, MKTG 621. Some certificate and non-ISEN courses may not be available to Distance Learning students at this time.

International Students Only:
Industrial internship - ISEN 684: 2 hrs, 1 hr per semester _____
(2 hours are required to be included in the degree plan for administrative purposes, but students are not required to use them. If used, does not count towards the minimum degree requirements of 36 hours. If not used, they will be removed before graduation.)

Notes: 1. A non-thesis degree requiring at least 36 hours.
2. ISEN 691 is not allowed and ISEN 681 hours will not count towards a degree requirement.
3. Graduate courses NOT allowed: CPSC 601 and STAT 651.
4. Generally, no undergraduate courses may be on degree plan. But with prior approval of ISEN Graduate Program Director, up to 2 non-ISEN undergraduate (400-level) courses may be used.
5. ISEN 620 may be used with ISEN 622 or ISEN 623 but not both; STAT 630 and 610 may not be on the same degree plan.
6. The cross-listed sections of ISEN courses (e.g., ISEN 642) are considered as ISEN courses.
PH.D. DEGREE CHECKLIST

Instructions: The purpose of this checklist is to summarize the department's Ph.D. requirements. However, you cannot design your degree plan without explicit help from an advisor, since each faculty member will have requirements beyond the minimal departmental and area requirements.

University Requirements
The total must be at least 64 hours beyond the Masters or 96 hours beyond the Bachelors. Additional university requirements can be found through the OGAPS website.

Department Requirements
A. Course requirements (minimum of 10 graded courses)

Qualifying Exam Courses and Advanced Courses (chosen in coordination with the student’s Advisor/Chair):

   __________   ___________   ___________   ____________
   ___________   ___________   __________

Additional Electives Related to Research Area

   ____________  _____________  ____________

B. Qualifying Exam procedure. This varies by student and is based on the intended area or research track. A student will only be given a conditional pass without a named faculty advisor. Refer to this Handbook for additional information regarding the qualifying procedure and required courses.

C. ISEN 681 Seminar (3 hours, taken as 1 credit over three semesters)

D. ISEN 691 Research (at most 31 hours for 64-hour degree plan, at most 63 hours for 96-hour degree plan. No more than 3 hours per regular semester may be taken before a student passes the qualifying exams, or these hours must be pre-approved by the Departmental Graduate Committee.)

E. International Students Only: ISEN 684 Industrial Internship (1 hr per semester, 3 hrs maximum; not required, but if used, does not count towards the minimum required 64 or 96 hours)

F. Students must take their Preliminary Exam by the end of the semester following the one in which they come within six hours of completing their degree plan course hours (not including ISEN 691).

G. Submit Dissertation Proposal (this can be done together with the Preliminary Exam, or separately, as determined by the student’s individual committee).

H. Defend dissertation, submit dissertation to and clear all requirements with the Thesis Office.

I. (Optional) Presentation of research results during a 681 Seminar, Student Society Seminar (such as INFORMS), or a national conference, and submission of papers to a refereed journal.

# Note: The following courses will not be allowed on a Ph.D. degree plan: all undergraduate courses except MATH 409, 446 and 447; and the following prerequisite courses ISEN 609, 620 (if 622 and 623 are used), CSCE 601, STAT 601 and STAT 651. STAT 610 or 630 will be allowed, but not both. At most, 3 hours of ISEN 685 may be used towards the degree plan.