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PhD Qualifying Process and Preliminary Exam– Appendix A

Operations Research PhD Qualifying Courses

The IOE Qualifying Process outcome will be determined on the basis of grades in *qualifying courses* and an assessment of the student's ability to conduct research based on development of a research proposal during the Fall term as part of IOE 800 requirements and outcomes from a directed research activity during the Winter term as part of IOE 801. All of these are considered as part of a holistic evaluation of the student's progress and readiness to become a PhD student. Evaluation is conducted by faculty review following the end of the Winter term.

Course selection: All first-year PhD students must have an advisor of record by the beginning of the Fall term. The advisor must approve the student's course plan for all terms as a Pre-Candidate. Students must take a minimum of four courses from the following list by the end of the Winter term:

1. IOE 610 – LP
2. IOE 511 or IOE 611 – NLP
3. IOE 614 – IP
4. IOE 515 – Stoch 1
5. IOE 516 – Stoch 2
6. IOE 512 – DP
7. STATS 600 – Stats
8. IOE 591 – Risk Analysis
9. IOE 574 - Simulation

In rare cases, course substitutions may be approved by the advisor and the Graduate Program Committee. It is expected the student will achieve a minimum GPA of 3.65 among all the courses taken from this group in year one. This above course list may change over time by vote of the faculty; however, it is expected that courses on this list will meet the following guidelines: a) be at a level considered to be consistent with preparation for PhD research; and b) be taught by regular IOE faculty members so that feedback can be provided at the annual department PhD assessment meeting. Any exceptions must be approved by the advisor and the Graduate Program Committee.

First-year Research: All students must take IOE 800 – First-Year Doctoral Seminar during the Fall term and IOE 801 – Directed Research during the Winter term. Students must prepare a written proposal by the end of the Fall term defining the expectations and anticipated research outcomes for their IOE 801 directed research project and this must be approved by their faculty advisor(s). The faculty advisor(s) will assign a letter grade and will provide a written assessment of the student's performance to the Graduate Program Committee at the end of the Winter term, prior to the departmental qualification evaluation meeting.

Students will be assessed following completion of the Winter term by a departmental faculty review with the following outcomes: *Pass, Conditional Pass, or Fail*. The assessment will take into account the research components of IOE 801 and IOE 802 and performance in first-year courses. In the event of a conditional pass, a carefully-defined plan of work will be developed by the advisor(s) in collaboration with the Graduate Program Committee; plans must be developed and approved by the advisor(s) and the

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Graduate Program Committee within two weeks of the faculty meeting for the student to continue in the PhD program.

IOE PhD Preliminary Exam Guidance for Operations Research Students

The Preliminary Exam will be an oral examination intended to determine the student's readiness to perform a well-defined research project and advance to Candidacy. The primary component of the exam will be the presentation and assessment of the written dissertation proposal. In order to be eligible to take the Preliminary Exam students must complete a minimum of eight didactic 3-credit courses (i.e., non-seminar and non-directed research courses) as an IOE graduate student.

PhD Program Checklist

The following checklist is intended to illustrate the requirements to prepare for the Qualifying Process and Preliminary Exams.

1. List four classes taken during the first year from the list of eligible courses:

Class 1: _____ Semester: _____

Class 2: _____ Semester: _____

Class 3: _____ Semester: _____

Class 4: _____ Semester: _____

2. List four additional classes to satisfy didactic requirements:

Class 1: _____ Semester: _____

Class 2: _____ Semester: _____

Class 3: _____ Semester: _____

Class 4: _____ Semester: _____

3. Research Courses and Seminars

IOE 800: First-Year Doctoral Seminar

IOE 801: Directed Research, provide advisor(s) name(s) and grade

IOE 802: Written and Oral Research Presentations

A minimum of one of the following seminar courses:

IOE 813: Seminar in Healthcare Systems Engineering

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IOE 899: Seminar in Industrial and Operations Engineering

4. Preliminary exam: <date>, Committee Members: _____

5. PhD Defense: <date>, Committee Members _____
