



Core requirements for Management Science & Engineering (MS&E) Master's Program

1. Optimization methods requirement: An optimization methods course beyond what may be found in a first course in operations research at the undergraduate level. Evidence of a second level optimization methods course in a student's undergraduate record allows this requirement to be met. Examples of courses that would satisfy this requirement would be:
 - a. ISE 406 – Introduction to Mathematical Optimization
 - b. ISE 416 – Dynamic Programming
 - c. ISE 418 – Discrete Optimization
 - d. ISE 426 – Optimization Models and Applications
 - e. ISE 455 – Optimization Algorithms and Software

Alternatively, a student may propose to the master's program adviser, in advance, an appropriate advanced level optimization methods substitute.

2. Data analysis course requirement: A course beyond a first course in probability and statistics at the undergraduate level. Evidence of a second level data analysis course in a student's undergraduate record allows this requirement to be met. Examples of courses that would satisfy this requirement would be:
 - a. ISE 364 – Introduction to Machine Learning
 - b. ISE 409 – Time Series Analysis
 - c. ISE 410 – Design of Experiments
 - d. ISE 465 – Applied Data Mining
 - e. MATH 312 - Statistical Computing and Application
 - f. MATH 334 - Mathematical Statistics
 - g. MATH 338 - Linear Models in Statistics with Applications
 - h. ECO 415 - Econometrics I

Alternatively, a student may propose to the master's program adviser, in advance, an appropriate advanced level data analysis substitute.



3. Stochastic processes methods requirement: A stochastic processes methods course beyond what may be found in a first course in operations research at the undergraduate level. Evidence of a second level stochastic processes methods course in a student's undergraduate record allows this requirement to be met. Examples of courses that would satisfy this requirement would be:
- ISE 339 – Stochastic Models and Applications
 - ISE 439 – Queueing Systems
 - ISE 404 – Simulation
 - Math 310 – Random Processes and Applications

Alternatively, a student may propose to the master's program adviser, in advance, an appropriate advanced level stochastic processes methods substitute.

4. The following courses may be counted as being part of the 21 credits that must be taken in the "major" of MS&E:
- ECO 412 - Mathematical Economics
 - MATH 467 - Financial Calculus I
 - MATH 468 - Financial Calculus II
 - MATH 311 - Graph Theory