Course List for Broadness Requirements

The breadth requirement is to make the Ph.D. student achieve minimum competence in multiple areas of industrial and systems engineering. It consists of taking at least two courses (6 credits) from a list of ISyE courses and attaining a grade of B or above in both courses. The courses selected by the student must be approved by the student’s advisor and must be in at least two areas that are different from the area group in which the student’s qualifying exam is taken. These courses must be completed before a PhD student can request their Preliminary warrant.

Courses the student has taken before entering the Ph.D. program will be counted toward this breadth requirement. Any transfer credits could also be counted toward this breadth requirement upon the approval by the area group(s) corresponding to the transferred course(s) and the Graduate Exam and Policy Committee.

From Decision Science and Operation Research area:

ISyE 425 Introduction to Combinatorial Optimization
ISyE 516 Introduction to Decision Analysis
ISyE 525 Linear Programming Methods
ISyE 620 Simulation Modeling and Analysis
ISyE 624 Stochastic Modeling Techniques
ISyE 632 Introduction to Stochastic Modeling
ISyE 633 Queuing Theory and Stochastic Modeling
ISyE 635 Tools and Environments for Optimization
ISyE 719 Network Flows
ISyE 720 Integer Programming
ISyE 723 Dynamic Programming and Associated Topics
ISyE 726 Nonlinear Programming Theory and Applications
ISyE 727 Nonsmooth Optimization
ISyE 730 Nonlinear Programming Algorithms
ISyE 735 Large Scale Optimization

From Health System Engineering area:

ISyE 417 Health Systems Engineering
ISyE 517 Decision Making in Health Care
ISyE 610 Design of Program Evaluation Systems
ISyE 617 Health Information Systems
ISyE 875 Assessment of Medical Technologies

From Manufacturing and Production Systems area:

ISyE 415 Introduction to Manufacturing Systems, Design and Analysis
ISyE 510 Facilities Planning
ISyE 605 Computer Integrated Manufacturing
ISyE 615 Production Systems Control
ISyE 641 Design and Analysis of Manufacturing Systems
ISyE 643 Performance Analysis of Manufacturing Systems

**From Human Factors Engineering area:**

ISyE 349 Introduction to Human Factors  
ISyE 555 Human Performance & Accident Causation  
ISyE 556 Occupational Safety & Health Engineering  
ISyE 564 Occupational Ergonomics & Biomechanics  
ISyE 652 Sociotechnical Systems  
ISyE 653 Organization & Job Design  
ISyE 662 Design & Human Disability & Aging

**From Quality Engineering area:**

ISyE 512 Inspection, Quality Control & Reliability  
ISyE 575 Introduction to Quality Engineering  
ISyE 520 Quality Assurance Systems  
ISyE 515 Engineering Management of Continuous Process Improvement  
ISyE 612 Information Sensing & Analysis for manufacturing Processes