OR 5374. Special Topics in Operations Research. 4 Hours.
Offers topics of current interest in operations research. May be repeated up to four times.

OR 6205. Deterministic Operations Research. 4 Hours.
Introduces the theory, computation, and application of deterministic models to represent industrial operations. Includes linear programming formulation and solution using spreadsheet and algebraic languages software; simplex, big-M, two-phase, revised simplex, and dual simplex algorithms for solving linear programs; introduction to the theory of simplex, fundamental insight, duality, and sensitivity analysis; transportation, assignment, and transshipment problems; shortest path, minimum spanning tree, maximum flow, minimum cost network flow problems and project networks; and discrete-state and continuous-state dynamic programming models and applications. Requires knowledge of linear algebra.

OR 6962. Elective. 1-4 Hours.
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

OR 6964. Co-op Work Experience. 0 Hours.
Provides eligible students with an opportunity for work experience. May be repeated without limit.

OR 6965. Co-op Work Experience Abroad. 0 Hours.
Offers eligible students an opportunity for work experience abroad. May be repeated without limit.

OR 7230. Probabilistic Operation Research. 4 Hours.
Introduces the theory and use of stochastic models to represent industrial operations. Topics include discrete-state Markov chains and applications, state transitions and properties, first passage probabilities, steady-state analysis; absorbing chains and absorption probabilities; introduction to continuous-time Markov chains, transition rates and steady-state analysis; basic elements of queuing systems, birth-and-death process, and special cases; steady-state analysis of simple queuing models including $M/M/s$, $M/M/s/K$, $M/M/s/N/N$ and their special cases; and queuing models involving nonexponential distributions.

OR 7235. Inventory Theory. 4 Hours.
Considers the nature and characteristics of inventory systems. Examines techniques of constructing and analyzing mathematical models of inventory systems with a view toward determining operating policies for such systems.

OR 7240. Integer and Nonlinear Optimization. 4 Hours.
Covers important families of mathematical programming problems and optimization methods. Discusses the cutting plane and the branch and bound algorithm for binary and mixed integer programming problems. Introduces nonlinear programming including unconstrained optimization, the Kuhn-Tucker conditions, gradient methods, and separable, quadratic, and geometric programming.

OR 7245. Network Analysis and Advanced Optimization. 4 Hours.
Considers concepts of advanced linear programming and network flows. Includes theory of the simplex method, the revised simplex algorithm using LU factorization, and simplex for bounded variables and primal-dual methods; methods for solving large-scale models such as Danzig-Wolfe decomposition, Benders' partitioning, Lagrangian relaxation, and subgradient optimization; computational complexity and Karmarkar’s algorithm; minimum cost network flows, network simplex, and generalized and multicommodity network flow problems; and special types of network problems including the traveling salesman, routing, network location, and reliability problems.

OR 7250. Multi-Criteria Decision Making. 4 Hours.
Offers theory, computation, and application of multicriteria decision making. Topics include conventional and criterion cone parametric programming; approaches for generating efficient solutions, such as weighted sums, e-constraint, reduced feasible regions, and Fourier-Motzkin elimination; vector maximum algorithms and ADBASE software; multiattribute utility theory; goal programming; analytic hierarchy process and Expert Choice software; filtering techniques; multiple objective fractional programming; and interactive and Tchebycheff procedures.

OR 7260. Constraint Programming. 4 Hours.
Covers the basic foundations of logic-based modeling and constraint programming, which includes logic of propositions, discrete variables and 0-1 inequalities, global constraints (all different, cardinality, cumulative, stretch, disjunctive, element, sum), consistency, constraint propagation, domain reduction, and search strategies (branching, backtracking). Constraint programming uses techniques from artificial intelligence, computer science, and operations research to solve combinatorial problems such as planning, scheduling, vehicle routing, the traveling salesman problem (TSP), staff rostering, and course timetabling. Also covers integrated constraint programming and mathematical programming methods such as Benders decomposition, column generation, relaxation, and local search methods.

OR 7310. Logistics, Warehousing, and Scheduling. 4 Hours.
Explores the determination of needs and requirements for logistics within large-scale manufacturing and business environments. Examines warehousing and scheduling in the context of a business logistics system. Introduces managerial, mathematical, and software tools and techniques for modeling and optimizing various aspects of the business supply chain. Considers approaches to examining warehousing operations and the associated algorithms.

OR 7340. Operations Research Engineering Leadership Challenge Project 1. 4 Hours.
Offers students an opportunity to develop and present a plan for the demonstration of a marketable technology product or prototype with an operations-research focus. Constitutes the first half of a thesis-scale project in technology commercialization. Requires work/training with a sponsoring organization or employer to improve a process or develop a project that is of significant value to the organization and demonstrates a quantifiable market impact while enhancing the student’s technological and engineering depth and fostering the student's leadership development.
OR 7442. Operations Research Engineering Leadership Challenge Project
2. 4 Hours.
Continues OR 7440, a thesis-scale project in technology commercialization. Offers students an opportunity to demonstrate their development of a marketable technology product or prototype with an operations-research focus and produce a written documentary report on the project to the satisfaction of an advising committee. Requires work/training with a sponsoring organization or employer to improve a process or develop a project that is of significant value to the organization and demonstrates a quantifiable market impact while enhancing the student’s technological and engineering depth and fostering the student’s leadership development.

OR 7945. Master’s Project. 4 Hours.
Offers theoretical or experimental work under individual faculty supervision.

OR 7962. Elective. 1-4 Hours.
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

OR 7978. Independent Study. 1-4 Hours.
Offers theoretical or experimental work under individual faculty supervision. May be repeated without limit.

OR 7990. Thesis. 1-8 Hours.
Offers analytical and/or experimental work conducted under the direction of the faculty in fulfillment of the requirements for the degree. Requires first-year students to attend a graduate seminar program that introduces the students to the methods of choosing a research topic, conducting research, and preparing a thesis. Requires successful completion of the seminar program. May be repeated without limit.

OR 7994. Thesis Continuation—Part Time. 0 Hours.
Continues thesis work conducted under the supervision of a departmental faculty member. May be repeated without limit.

OR 7996. Thesis Continuation. 0 Hours.
Continues thesis work conducted under the supervision of a departmental faculty member.