

MANAGEMENT SCIENCE

Courses

MSC 521. Introduction to Operations Research. 3 Hours

This course covers methods, principles and fundamentals of deterministic and stochastic operations research. Emphasis is on the formulation and solution of mathematical models in decision making environments, the search for optimal solutions to these decisions, and the explicit treatment of uncertainty through the use of probabilistic modeling and statistical analysis. Models include linear and non linear programs, inventory and production models, decision analysis, forecasting, and queuing. Corequisite(s): ENM 500.

MSC 523. Nonlinear Optimization. 3 Hours

This course concentrates on methods and engineering/management science applications of nonlinear optimization. Both single- and multi-variable methods as well as unconstrained and constrained problems are addressed. The course blends theoretical results such as the Kuhn-Tucker conditions and numerical search techniques such as conjugate directions with applications.

MSC 535. Applied Operations Research/Management Science. 3 Hours

This is a capstone course focused on the art rather than the 'science' of problem solving in management science and operations research. Emphasis is placed on the techniques of problem solving and model building, examination of unique problem cases, and a course project requiring modeling, data collection, and analysis. Prerequisite(s): Completion of the management science core courses or equivalent.

MSC 544. Forecasting & Time Series Analysis. 3 Hours

Concentration on statistical techniques for modeling and predicting discrete time-series phenomena, with emphasis on understanding and applying forecasting tools in analysis and management settings. Both classical smoothing methods and the Box-Jenkins methodology for model identification, estimation, and prediction are presented. Prerequisite(s): MSC 500 or equivalent.

MSC 555. System Dynamics I. 3 Hours

Introduction to the methodology for modeling the dynamics of complex engineering, business, and socioeconomic systems. These models are used to study the effect of organizational policies and design in higher-order, multiple-loop, nonlinear feedback systems.

MSC 572. System Simulation. 3 Hours

This course is an introduction to stochastic discrete event simulation of complex systems and human performance. Topics covered include model creation, 2D and 3D animation, the process of generating random numbers and random variables, the analysis of input data, the computer modeling of real systems, validation and variation, and the analysis of simulation output. Emphasis is on modeling real-world systems using modern software. Prerequisite(s): ENM 500 or equivalent.

MSC 595. Current Problems. 1-3 Hours

Topics of current interest in specialized areas of Management Science.

MSC 599. Thesis. 1-6 Hours

Thesis in Management Science.