THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Nonlinear and Dynamic Optimization

ISE 3210

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)

Course Components:
Lecture

Course Description:
Introduction to nonlinear, dynamic, and network optimization models and solution techniques.

Prerequisites and Co-requisites:
Prereq: 3200 and enrollment in ISE or Engineering Physics major.

Course Goals / Objectives:
- Model decision problems with nonlinear, dynamic, or multiple objectives
- Recognize model convexity
- Use descent algorithms to solve nonlinear programs and recognize optimality of solutions
- Set up dynamic programming recursions for deterministic models
- Draw upon background in engineering sciences to model decision problems that arise within engineering applications
- Apply nonlinear programming techniques to model decisions with multiple stakeholders and with game theoretic considerations
- Use modeling and optimization software packages to model and solve nonlinear and dynamic programs

Course Topics:

- Nonlinear programming models
- Optimality conditions for nonlinear programs
- Direct search and steepest descent algorithms
- Dynamic programming
- Multiobjective modeling
- Application of nonlinear programming to game theory
- Software

Designation:
Required