



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Decomposition Techniques in Mathematical Programming

ISE 5230

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate

Course Components:

Lecture

Course Description:

This course provides a description of decomposition techniques to solve large-scale optimization problems with decomposable structure. Partitioning techniques considered include Dantzig-Wolfe, Benders and Lagrangian decompositions. The considered techniques are illustrated using examples and case studies from the energy sector.

Prerequisites and Co-requisites:

Prereq: 3200 and 3210, or Grad standing.

Course Goals / Objectives:

- Objective 1: To comprehend decomposition techniques in linear programming
 - Objective 2: To comprehend decomposition techniques in nonlinear programming
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Course Topics:

- Topic 1: Decomposition in linear programming. Complicating variables. Complicating constraints. Dantzig-Wolfe Decomposition.
 - Topic 2: Duality in nonlinear programming. Sensitivities.
 - Topic 3: Decomposition in nonlinear programming. Complicating variables. Complicating constraints. Augmented Lagrangian Decomposition. Optimality Condition Decomposition.
 - Topic 4: Decomposition in mixed-integer programming. Complicating variables. Complicating constraints.
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Designation:

Elective