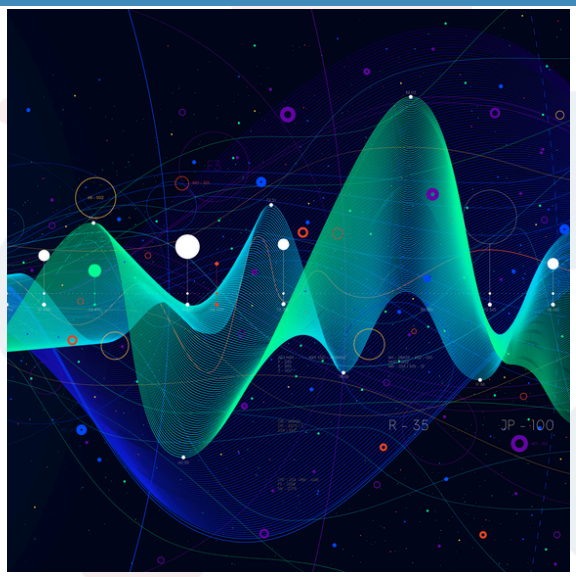
THE UNIVERSITY OF ARIZONA
COLLEGE OF ENGINEERING
Systems & Industrial Engineering

SIE 540 SURVEY OF OPTIMIZATION METHODS

COURSE DESCRIPTION

Survey of methods including network flows, integer programming, nonlinear programming and dynamic programming. Models development and solution algorithms are covered.



EXPECTED LEARNING OUTCOMES

Students are able to develop a working knowledge of different types of optimization methods in these directions:

- Learning solution approaches for linear/integer/dynamic/nonlinear programming and some network optimization problems.
- Developing an appropriate optimization model from a verbal description of a problem.
- Choosing an appropriate solution technique.
- Extracting relevant information from the model and solutions.

COURSE FORMAT

- In-Person| **15-week** semester
- Tailored to your **professional needs**
- **3-credit** hour | You may apply it towards SIE MS and PhD programs
- **SIE 340** or equivalent, knowledge of linear programming

PROGRAM DIRECTOR
Dr. Pavlo Krokhmal
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ENROLLMENT
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COURSE SCHEDULE

LINEAR PROGRAMMING REVIEW

- Modeling, Simplex Method, Big M and Two-Phase Methods, Duality, Dual Simplex Method, Sensitivity

NETWORK OPTIMIZATION

- Transportation Problem, Transportation Simplex Method, Terminology, Shortest Path Problem, Minimum Spanning Tree Problem, Maximum Flow Problem, Minimum Cost Flow Problem, Network Simplex Method

INTEGER PROGRAMMING

- Modeling with Integer Variables and Binary Variables, Branch-and Bound Algorithm, Cutting Plane Algorithm

NONLINEAR PROGRAMMING

- Review of Differential Calculus, Types of Nonlinear Programming, Convexity of Junctions, One-Variable and Unconstrained Optimization, Convex Programming

DYNAMIC PROGRAMMING

- Examples, Solution Procedure

Real-World Application | **Flexible/Interactive Learning** | **Bridge Theory & Practice** | **Innovative Curriculum** | **Distinguished Faculty**

FROM EFFICIENCY TO INNOVATION–LEAD THE FUTURE OF INDUSTRIAL ENGINEERING.