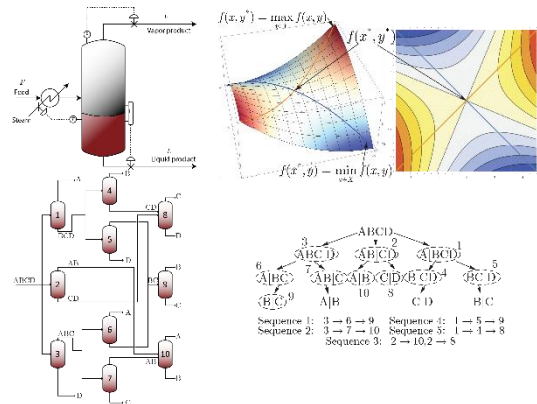


Graduate Courses in Systems Engineering

SE 5102 Uncertainty Analysis, Robust Design, and Optimization

What's Exciting About this Course? Learning to quantify uncertainty and design more robust systems accounting for uncertainty in robust decision-making at the design stage.

Course Description. This course is designed to provide students with a thorough understanding of model-based uncertainty analysis, robust design, and optimization of process systems. The course is organized into five learning modules: numerical analysis and optimization, uncertainty analysis, sensitivity analysis in design, robust design, and flexibility analysis.



Course Outcomes

- Exhibit proficiency in optimization theory, methods, and software application
- Develop skills in model-based uncertainty analysis
- Formalize mathematically complex problems of robust design in systems engineering
- Analyze, solve, and present a model-based design approach for an industrially-relevant system
- Communicate rigorously mathematical findings

Topics: Product and Process Development, Optimization, Design of Experiments, Sampling Methods, Uncertainty Analysis, Sensitivity Analysis, Capability Analysis, Dynamic Systems Capability, Robust Design, Reliability, Flexibility, Critical Parameter Management, Root Cause Analysis

Course Objectives and Links to Overall Program Goals

This course is designed to provide students with the foundations of model-based methods for uncertainty analysis and robust design of process systems. This course builds upon the understanding of process systems engineering including modeling, numerical analysis, and optimization to design more robust systems.