

ISYE 3106 COURNERSTONE DESIGN

Concentration breadth elective for BSIE

Credit: 3-0-3

Prepared Profs. Nazzal, Tokol-Goldsman, 2025

Prerequisite(s): ISYE 3030 Basic Statistical Methods with concurrency

Text: No textbook is assigned; we will use a series of readings and Senior Design cases. Canvas and MS Teams are the mandatory communication tools in this class. All class-related materials are posted there.

Catalog Description

Structure a complex problem through information gathering, data analysis, industrial engineering and design principles application, project management, while working in and leading diverse teams.

Course Description

This course introduces students to problems in Industrial and Systems Engineering through project-based learning utilizing past Senior Design projects. Emphasis is on identifying and specifying the opportunities for improving a system through diagnostic data analysis, scoping a solution strategy, and writing/presenting a proposal for addressing the clients' needs. In addition, students will receive guidance to help develop their professional skills in communication, professionalism, and teamwork.

Major Milestones in approximate weeks

1. 2nd week: Complete team formation
2. 5th week: Field project (data collection and analysis) presentation to class
3. 9th week: Design challenge initiation project report and presentation to class
4. Last week: Final project (Frame-the-design) report and presentation to class

Course Learning Outcomes and relationship to BSIE Program Learning Outcomes

At the end of this course, the students will be able to:

1. Identify, break down, and define a problem/opportunity statement for an industrial engineering design project
2. Practice the information and data collection process to define the problem, understand the context, and identify the opportunities
3. Develop the essential components of writing and presenting a business/ Industrial Engineering design proposal
4. Be effective in a collaborative and inclusive team to meet objectives and learn to provide feedback
5. Write and present a proposal for solving problems addressed with Industrial Engineering methodologies

Course outcome \ Program Outcomes								
1. Identify, breakdown, and define an IE problem/opportunity	H	1. identify, formulate solve engg prob by engg, sci & Math	2. produce solutions consider public health, safety, welfare, global, cultural, social, environ & economic	3 communicate with a range of audience	4 recognize ethical & professional responsibilities, make informed judgement consider resolutions in global, economic, environ and societal context.	5. effective on a team provide leadership, collaborative and inclusive envirn, plan tasks & meet objectives	6. develop and conduct experiment, analyze and interpret data & use engineering judgement to draw conclusions.	7. acquire and apply new knowledge using appropriate learning strategies
2. Practice the info and data collection process to define the problem, understand the context, and identify the opportunities			H			H	M	M
3. Develop the essential components of writing a business/IE proposal			H				M	
4. Be effective in a collaborative and inclusive team to meet objectives				H	H			
5. Write, present a proposal for solving problems addressed with IE methodologies	H		H					

Assessment of the important outcomes

Please use H for high importance for assessment. M for medium importance. Will not normally be assessed. L or blank will not be assessed.