

# SYSE 532

## DYNAMICS OF COMPLEX SYSTEMS

Offered every Fall

*Prereqs: SYSE501 or concurrent*

### DESCRIPTION

This course deals with understanding the higher-level behavior and issues that emerge from interaction between components in complex socio-technical systems. The course emphasizes system thinking, dynamic cause and effect relationships, and the higher-level emergent behavior that results from the interaction of many smaller effects that are individually well understood, but more difficult to grasp at a higher level.

### BENEFITS

Systems engineering is an interdisciplinary approach and means to enable successful systems. By focusing on what the customer needs, how it should function, defining the requirements, and then design synthesis, validation, and verification, real solutions to complex problems can impact every type of system.

### COURSE OBJECTIVES

Systems dynamics deals with understanding the higher-level behavior and issues that emerge in complex socio-technical systems. Students successfully completing this course will be able to:

- Solve a spectrum of problems that arise when designing complex engineering systems by applying system dynamic principles and tools
- Develop/Improve their systems-thinking skills
- Model and extract important emergent dynamic behavior from interactions between sub-components of a complex engineering system
- Use objective and practical skills grounded in engineering to deal with the typical hurdles that mature engineering system organizations deal with

