NEW JERSEY INSTITUTE OF TECHNOLOGY

Department of Industrial Engineering

IE 685

System Safety Engineering

Fall 2023

Instructor: George Olsen, Ph.D, CSP, PE.
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Textbook: None – Readings in Canvas

Description: The course will focus on systems safety engineering and design safety. The various topics include developing and implementing system safety programs, system safety planning, decision making using statistical tools, and system safety engineering analysis techniques and methods.

Objectives:

1. Be able to identify and analyze hazards and risks using system safety techniques such preliminary hazard analysis, subsystem hazard analysis, and fault tree analysis.
2. Use statistical tools and methods to understand safety and health decision making..
3. Understand prevention through design techniques to minimize safety, health and environmental risk during system design, redesign, operations, and maintenance.

Evaluation: Midterm Exam - 25%
Final Exam - 35%
Project – 20%
Assignments – 20%

Academic Integrity:

In accordance with the NJIT academic integrity code, students are expected to do their own work. If they use somebody else's work, then that fact should be documented. Individual work is to be done individually and not copied from others and it is expected that you will perform all exams without consulting others and do your own work on any assignments. Consulting with others on general approaches to take in an assignment is considered acceptable, but copying assignments from others or working the majority of the assignment together is not acceptable. Of course group work is done in a group. See https://www.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf for more information on NJIT's academic integrity code.

CLASS SCHEDULE

Week	Topic	Readings
1	Class Introduction, Background, History of System Safety	All Reading/ Canvas

2	Connecting System Safety and Industrial and Construction Safety Risk and Safety Engineering	Clemens Overview of Sys Safety
3	Prevention through Design [PTD]	Manuel PTD article
4	Quantitative Tools for System Safety Decision Making	Stat Handouts
5	Quantitative Tools for System Safety Decision Making Continued	Stat Handouts
6	**Midterm**	
7	System Safety Analysis Introduction Preliminary Hazard Analysis	Basic Guide to Sys Safety
8	Preliminary Hazard Analysis [continued] Project Introduction	PHA Examples
9	Subsystem and System Hazard Analysis	FAA Hazard Analysis Chapter
10	Other System Safety Analysis Techniques	Basic Guide to System Safety
11	Fault Tree Analysis	FTA Powerpoint

12	Fault Tree Analysis Continued	Fault Tree Examples
13	HAZOP, Human Reliability, and Software Safety	3 Powerpoints on the 3 areas
14	Final Project Reports	
15	Final Exam	