Instructor: Darrell Morgeson (jmorgeso@ida.org)

Office Hours: Mondays after class, by appointment only.

Course Objective: To explore the use of probability and probability models to perform risk analyses in the homeland and national security arenas.

Learning Outcome: Upon completion of the course a student should be able to apply fundamental concepts of Bayesian probability to real world applications.

Course Description: This course will focus on 9/11-like, real-world risk assessments and applications. Many approaches to estimating risk have already been used in the US Critical Infrastructure Key Resources (CIKR) arena; the course will provide an overview of these approaches, their strengths and weaknesses, before leading students through practical exercises that allow them to develop their own applications of risk concepts in a CIKR setting. Specific topics to be covered include background and overview of the emergence of the 18 CIKR Sectors, overview of the basic risk models that have been used in various sectors, and strengths and weaknesses of various risk models. Other topics include Classical “Expected Value” Risk, subjective probability vs. frequentist probability, event trees / fault trees, the development of a simple risk model for CIKR assets, expert elicitation, Monte Carlo models, conditional risk, total risk, risk of complex targets and systems, and current state of practice.

Grading Policy: Homework, final project and active class participation.