THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Information Analysis and Synthesis

ISE 5730

Credit Hours:
3.00 - 3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate

Course Components:
Lecture

Course Description:
Professional information analysis in engineering, intelligence/security, business, and health care that identifies the factors that make the analytical process shallow or rigorous.

Prerequisites and Co-requisites:
Prereq: Sr or Grad standing, or permission of instructor.

Course Goals / Objectives:
- Learn the cognitive components of professional information analysis
- Describe what is a good analytic process
- Know basic vulnerabilities that can lead to shallow, narrow, erroneous analyses
- Carry out the steps in hypothesis exploration in order to find the best explanation and avoid surprise
- Critique an analysis based on the definition of what is sufficient rigor
- Develop a briefing of analytical results for policy or decision makers (what is actionable intelligence)
- Test whether new computer and visualization tools support good analytic process and reduce the vulnerability to shallow/narrow analysis

Course Topics:
- Introduction: What is a good analytical process (the basics of professional information analysis)?
- Surprise in information analysis Analyze a case of surprise in international affairs. Sample case—the Yom Kippur war intelligence surprise
- Cognitive factors in analysis Data overload Finding valuable sources Avoiding premature closure Conflict and corroboration (finding and resolving discrepancies Sense making
- Engineering safety analysis. Sample case—The return to flight decision after the Columbia space shuttle accident.
- Energy security in an international humanitarian and sectarian crisis
- Critique the quality of an information analysis. Sample case—detecting accounting fraud.
- Do a professional information analysis: Sample case—How does the threat of terrorism change the risks of where to put liquefied natural gas transport hubs and how to safeguard liquefied natural gas tanker operations for a government body?
- Adversarial Intent Typical errors
- Connecting analysis to action plans Actionable intelligence, analysis and re-planning (tactical analysis), briefing policy/decision-makers.
- Integration Review of fundamental principles
- How can automation, computers, visualizations support good analytic process (visual analytics)
- Hypothesis exploration (avoiding surprise)—how to determine the best explanation Managing multiple constraints
- Collaboration and analysis. The role of multiple perspectives in analysis How to avoid error in analysis? How broadening checks reduce the tendency to premature narrowing.

Designation:
Elective