IND E 470 SYSTEMS ENGINEERING

FALL QUARTER
Elective

CATALOG DATA: SYSTEMS ENGINEERING, 4 credits
Concepts of system approach, system hierarchies, functional analysis, requirements, trade studies, and other concepts used to define and integrate complex engineering systems. Introductions to risk analysis and reliability, failure modes and effects analysis, writing specifications, and lean manufacturing. Offered: jointly with AA 470.

PREREQUISITES BY TOPIC: Computer literacy of spreadsheets, power point and, word processors.


REFERENCES: None

OBJECTIVE: This course will provide students with the basic concepts used to perform fundamental systems engineering tasks such as mission analysis, functional analysis, requirements and constraint development and allocation, product and program specification generation, systems testing, operations, risk analysis, delivery, and disposal. It is designed to provide a systems viewpoint that examines all functional interfaces and considers a product over its entire life cycle. The course will focus on engineering communication, particularly writing and documenting requirements and project management.

OUTCOMES: 1) Students will be able to quantitatively evaluate system interfaces. 2) Students will be able to quantify risk and reliability. 3) Students will be able to write a simple component specification. 4) Students will be able to develop elements of a project plan

TOPICS: 1) System Definition 2) Project Management (PERT, Gannt, WBS, Budgets, Teams) 3) Risk Assessment 4) Specialty Engineering (Reliability, Maintainability, Human Factors) 5) Engineering Requirements 6) Writing Specifications 7) Failure Modes and Effects Analysis 8) Lean Manufacturing, 6-sigma design 9) Systems Architecture

CLASS SCHEDULE: Two 110 minute lectures per week

LABORATORY PROJECTS: None

COMPUTER USAGE: 1) Microsoft Word, Project, and Excel

RELATIONSHIP TO ABET OUTCOMES:

a) An ability to apply knowledge of mathematics, science, and engineering.

b) An ability to define a system, component, or process to meet desired needs.

c) An ability to identify, formulate, and solve engineering problems.

d) An ability to communicate effectively.

f) The broad education necessary to understand the impact of engineering
   solutions in a global, economic, environmental, and societal context.

g) A recognition of the need for, and an ability to engage in life-long learning.

h) An ability to use the techniques, skills, and modern engineering tools necessary
   for engineering practice.

COORDINATOR: Adam Bruckner, Professor, Apr. 2007

PREPARED BY: Undergraduate Committee, 4/2007

ASSESSMENT:

1) Homework – 4 Writing Projects

2) Exams (Mid Term and Final)

3) Group Projects – 1 Specification Writing Project, 1 Project Plan Writing
   Project, 1 Failure Analysis Project