SYSE 3010 - Principles and Methods of Systems Engineering

This course is required for all Engineering majors pursuing the Systems Engineering concentration.

Course Coordinator:
Evelyn C. Brown

Catalog Description:
Areas of development include systems engineering foundations, systems engineering methodologies and processes, limitations of systems engineering for complex systems, human element in systems engineering, complex system transformation, interoperability and system architecture, planning for systems engineering, risk analysis and management, systems engineering capability maturity assessment and development, organization for performing systems engineering, and introduction to system of systems engineering.

Course Structure:
Two 75-minute lectures per week (three credits)

Prerequisites:
None

Required Materials:
1. *Systems Engineering and Analysis, 4th Edition,* Benjamin S. Blanchard and Wolter J. Fabrycky, Prentice Hall, 2006. ISBN 0-13-186977-9

Course Objectives:
Upon completion of this course each student will be able to:

- Understand the principles and concepts that form the foundations for systems engineering.
- Apply standards, processes, and approaches used to conduct systems engineering.
- Perform conceptual design and detailed planning necessary to manage development of a complex system.
- Develop capabilities for understanding, assessing, and resolving human, technical, and administrative issues for complex systems engineering.
- Demonstrate sophistication and competency in design, analysis, and evaluation of systems engineering in a technical environment.

Lecture Topics:

- system science and engineering (4.5 hours)
- bringing systems into being (4.5 hours)
- conceptual system design (3 hours)
- models for economic evaluation (3 hours)
- preliminary system design (3 hours)
- detail design and development (3 hours)

- system test, evaluation, validation (4.5 hours)
- designing systems for affordability (4.5 hours)
- designing systems for reliability (3 hours)
- designing systems for maintainability (3 hours)

Relevant Program Outcomes:
Graduates of the Engineering Program will demonstrate:
c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
j) a knowledge of contemporary issues.
l) an ability to design, develop, analyze, implement, and improve integrated systems that include people, materials, information, equipment, and energy

Professional Component Content:
Math/Science: 0; Engineering: 3 credits; General Education: 0

Assessment Requirements:
Student Work Samples:
- Homework assignment (outcome h)
- Project introductory section (outcome j)

Student Course Survey

Last Review:
October 15, 2008 by Evelyn C. Brown