# Course Syllabus

**Course Number:** E M 565  
**Course Name:** Introduction to Systems Management  
**Instructor:** Alice Squires  
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**Semester Credits:** 3  
**Prerequisites:** None

## Course Description and Objectives:

The design, manufacture, and operation of complex systems present a major challenge for today's managers. These systems, encumbered with schedule and cost constraints while pushing the state of the art technology, demand new tools for project planning, organizing, and controlling. This course is designed to assist engineering managers, chief systems engineers, system architects, and technical project/program managers with projects involving complex system development and hardware, software, electrical, mechanical and manufacturing engineers. The course includes case studies to relate concepts to real-world practice and demonstrate how projects can succeed with the proper implementation of systems engineering management. This course can be taken as part of the ETM master's degree, systems engineering certification program, or for continuing education. Students will gain a foundation in systems engineering management. After taking this course, the student will be able to:

- Understand the interdisciplinary processes critical to complex system development including system architecture, requirements, feasibility analysis, logistics and maintenance support concepts, technical performance measures, functional analysis, requirements allocation, systems synthesis, analysis, and design optimization, design integration, test and evaluation, production, operations, sustainment, and system retirement and disposal.
- Identify a current deficiency, problem, or opportunity that can be addressed with the design of a system solution; develop a clear succinct need statement for the system in the domain and language of the stakeholder; and complete the system concept selection process.
- Define a comprehensive set of system design requirements for the system solution that span the entire system life cycle and incorporate the essential design engineering disciplines.
- Perform design and supplier review and evaluation through formal design reviews for the conceptual system design, preliminary system design, equipment/software design, and detailed/critical design and development.
- Define and manage a design change and system modification process.
- Develop a systems engineering management plan (SEMP) / systems engineering plan (SEP) for a complex system that includes program and outsourcing requirements, integration of engineering specialties, risk management, and management of global applications and relationships.
- Organize to enable a successful systems engineering supportive culture.

## Course Topics:

- Introduction to Systems Engineering
- The System Engineering Process
- System Design Requirements
- Engineering Design Methods and Tools
- Design Review and Evaluation
- System Engineering Program Planning
- Organization for Systems Engineering
- System Engineering Program Evaluation
- Functional Analysis
- Life-Cycle Cost Analysis
- Design Reviews
- Supplier Evaluation
- Case Studies:
  - Failure Mode, Effects, and Criticality Analysis (FMECA)
  - Fault-tree Analysis (FTA)
  - Reliability-Centered Maintenance (RCM)
  - Maintenance Task Analysis (MTA)
  - Level of Repair Analysis (LORA)
  - Design Evaluation of Alternatives
  - Life-Cycle Cost Analysis (LCCA)
  - Organizational Structure’s Effect on Development
  - Implementation in Hardware vs Software

## Grading:

Participation: 10%, Discussion: 20%, Quizzes: 30%, Team Present: 10%, Final Project: 30%