

East Carolina University - Department of Engineering - Course Syllabus

**ISYS 3010 - Principles and Methods of Industrial and Systems Engineering**

Catalog Description

**ISYS 3010. Principles and Methods of Industrial and Systems Engineering (3) (F)** 3 lecture hours per week. P: junior standing in engineering. Systems engineering methodologies, and processes; conceptual system design; testing; design review; multiple criteria design decisions; and design for reliability. Introduces engineering management and organization principles, team building, leadership, motivation, and quantitative decision making.

Required Materials:

1. Blanchard, Benjamin S. and Wolter J. Fabrycky *Systems Engineering and Analysis (4th Edition)*. Prentice Hall, 2005, ISBN 978-0-131869776
2. National Council of Examiners for Engineering and Surveying, *Fundamentals of Engineering Supplied-Reference Handbook (8th Edition)*, 2008, ISBN 978-1-932613-30-8.

Course Objectives:

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

- Understand and apply the principles and concepts that form the foundations for systems engineering.
- Perform conceptual design and detailed planning necessary to manage development of a new system.
- Perform system test and evaluation.
- Perform critical design review of a proposed system.
- Determine reliability of serial network, a parallel network, or combination of the two.
- Apply management principles of planning, organizing, leading, and controlling.

Lecture Topics:

- system science and engineering (1.5 hours)
- bringing systems into being (1.5 hours)
- conceptual system design (3 hours)
- models for economic evaluation (3 hours)
- preliminary system design (1.5 hours)
- detail design and development (1.5 hour)
- system test, evaluation, validation (3 hours)
- flowcharts, functional flow block diagrams, and related diagramming tools (including management and planning tools)(2 hours)
- decision theory (3 hours)
- designing systems for affordability (2 hours)
- designing systems for reliability (2 hours)
- designing for manufacturability (1.5 hours)
- engineers as managers/leaders (planning/organizing/leading/controlling) (3 hours)
- organizational structure, job evaluations and compensation (2 hours)
- motivational theories of industrial management (3 hours)
- TQM theory (2 hours)
- marketing management for engineers (2 hours)
- 3 tests during semester (4.5 hours)

**Grading:**

<b>Grading</b>		<b>Assessment</b>	
A	90% or better	Homework/Assignments	25%
B	80% or better	Project	15%
C	70% or better	Tests (3)	45%
D	60% or better	Final Exam	15%
F	Less than 60%	Total	100%