

SYST 330: Systems Methods
Spring 2017

Instructor: Prof. KC Chang
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Class room: Planetary Hall 212 (1:30 - 2:45 PM, TR)

Course web site: GMU Blackboard

COURSE DESCRIPTION

The objective of this course is to provide students with a general introduction to a variety of quantitative techniques that are relevant to systems engineering. The focus is on the use of quantitative techniques to model and evaluate design options. The scope of this course include: Analysis methods of systems engineering design and management, decision analysis, models for engineering economics and evaluation, probability and statistical methods for data analysis, management control techniques, safety, reliability, and maintainability analysis, risk and uncertainty management, and life cycle cost analysis.

Prerequisite

Prerequisites: Math 114, Coreq: SYST 221, STAT 344

COURSE OUTLINE

Topics	Reference
<i>Alternative and Models in Decision Making</i>	Chap. 7
<i>Models for Economic Evaluation</i>	Chap. 8
<i>Engineering Economic and Analysis</i>	Text II and Handouts
<i>Probability and Statistical Methods for Analysis</i>	Handouts
<i>Control Concepts and Techniques</i>	Chap. 11
<i>Design for Reliability</i>	Chap. 12
<i>Reliability and Safety Analysis</i>	Handouts
<i>Design for Maintainability</i>	Chap. 13
<i>Design for Economic Feasibility</i>	Chap. 17
<i>Risk and Uncertainty Management</i>	Chap. 19 and Handouts

COURSE ASSIGNMENTS AND GRADING

This course will have weekly Homework assignments, two midterms, a final exam, and random quizzes. They will constitute 20%, 20%, 20%, 30% and 10% of the grade, respectively. Some homework assignments may be done using *MATLAB* or *R*.

COURSE MATERIALS

I. Required text: Blanchard and Fabrycki, *Systems Engineering and Analysis*, 5th Edition, Prentice Hall, 2011.

II. Supplement text: J. Sepulveda, W. Souder, B. Gottfried, *Engineering Economics*, Schaum's outlines, McGraw Hill, 1984.

COURSE SCHEDULE

Wk#1	Course Introduction/Decision Making Model	Chap 7
Wk#2	Decision under Risk and Uncertainty	Chap 7
Wk#3	Basic Engineering Economics Concept	Text II
Wk#4	Economic Models and Evaluation	Chap 8, Text II
Wk#5	Mid-term 1: Chap. 7, 8, Text II	
Wk#6	Probabilistic Concept and Analysis	Appendix, Handouts
Wk#7	Statistical Methods	Handouts
Wk#8	Spring Recess	
Wk#9	Systems Engineering Data Analysis	Handouts
Wk#10	Mid-term 2: Appendix, Handouts	
Wk#11	Control Concepts and Techniques	Chap 11
Wk#12	Reliability and Safety: Concept and Evaluation	Chap 12, Handouts
Wk#13	Maintainability: Analysis and Evaluation	Chap 13
Wk#14	Design for Economic Feasibility and Life-Cycle Cost	Chap 17
Wk#15	Risk and Uncertainty Management	Chap 19, Handouts
Wk#16	Final Exam: Chap. 11, 12, 13, 17, 19, Handouts	