

**SYST 330: Systems Methods**  
**Spring 2016**

**Instructor: Prof. KC Chang**  
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**Class room: Planetary Hall 206**

**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**

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

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