

SYSE 575

Reducing Risk In Decision Making

1. Basic Information:

- a. Course Number: SYSE 575
- b. Course Title: Reducing Risk In Decision Making
- c. Credit Hours: 4
- d. Instructor: William "Ike" Eisenhauer, M.Eng. Sys. Eng., BS Mech. Eng.
- e. Class Location: Online
- f. Class Hours: Online – New "Week" begins on Mondays
- g. Texts:

Making Hard Decisions: An Introduction to Decision Analysis (2nd Ed)
[Clemen]
ISBN 0534260349
Referred to as MHD in Reading Lists and Presentations

Risk Modeling for Determining Value and Decision Making
[Koller]
ISBN 1584881674
Referred to as RMD in Reading Lists and Presentations

NASA SE Handbook
Available In Course Online
Referred to as NASA-SE in Reading Lists and Presentations

NASA PRA Handbook
Available In Course Online
Referred to as NASA-PRA in Reading Lists and Presentations

- h. Office Hours: By appointment
- i. Phone: 503-440-6022
- j. Email address: wde@pdx.edu or through WEBCT
- k. Mailbox: CECS Dean's Office, Engineering Building. Building Suite 500
- l. Final Exam: Online WebCT Exam – Self Schedule During Exam Week

2. Course Description

- a. This course provides introduction to the assessment and management of risk in decision making that occurs in the system engineering process; including risk in the decision, as well as risk in the choice of method to decide.

3. Specific Goals and Objectives:

The student will gain knowledge and skills necessary to:

- a. Assess risk, quantitatively and qualitatively
- b. Model Risk through various methods
- c. Understand the concept of valuation of risk [i.e. utility] and its inherent subjectivity
- d. Evaluate the value of information to enable the assessment of consultants and advice
- e. Probabilistic and stochastic representations of risk and how to utilize these concepts
- f. Develop multiple, potential conflicting, objective models for decision making

4. **Logistics:**

Success in this course will require:

- a. Reading and completing weekly assessments by the assigned date
- b. Posting assignment results on, or before, the assigned date
- c. Successful completion of Mid-Term and Final Examinations
- d. Active participation in online discussions in the forums

5. **Metrics for Student Progress**

- a. Total of 400 points
 - i. Written Assignments [4] (180 points total)
 - ii. Mid-Term Exam (110 points)
 - iii. Final Exam (110 points)
- b. Grades will be assigned as follows (this is the minimum guaranteed distribution, the instructor reserves the right to adjust the lower thresholds as needed to ensure adequate representation of effort)
 - i. 400-372 : A
 - ii. 371-360 : A-
 - iii. 359-348 : B+
 - iv. 347-332 : B
 - v. 331-320 : B-
 - vi. 319-308 : C+
 - vii. 307-292 : C
 - viii. 291-000 : F
- c. Refer to WebCT for due dates. ***There is a 5 point penalty per day late*.**

6. **Tentative Week Plan [Deliverables are Due by 8AM PST on Monday of Following Week]**

- a. Week 1 [Mar 30]: Reading
- b. Week 2: [Apr 6]: Reading / Written Assignment #1
- c. Week 3: [Apr 13]: Reading
- d. Week 4: [Apr 20]: Reading / Written Assignment #2
- e. Week 5: [Apr 27]: Reading / Mid Term
- f. Week 6: [May 4]: Reading
- g. Week 7: [May 11]: Reading
- h. Week 8: [May 18]: Reading / Written Assignment #3
- i. Week 9: [May 25]: Reading
- j. Week 10: [Jun 1]: Reading / Written Assignment #4
- k. Week 11: Finals Week

7. **Tentative Week Topics and General Reading [Specifics and Adds will be given each week]**

- a. Week 1 What is Risk? What is Decision Making?
 - i. MHD: Chap. 1, 2, 13 RMD: Introduction
- b. Week 2 Laying Out a Decision
 - i. MHD: Chap. 3 RMD: Chap. 12, 13
- c. Week 3 Valuing Risk/Benefits: Utility
 - i. MHD: Chap. 14 RMD: Chap. 16
- d. Week 4 Methods of Choice
 - i. MHD: Chap. 4
- e. Week 5 Uncertainty Representation
 - i. MHD: Chap. 7, 8
- f. Week 6 Probability Distributions
 - i. MHD: Chap. 9,11 RMD: Chap. 15
- g. Week 7 Value of Information
 - i. MHD: Chap. 12
- h. Week 8 Sensitivity in Decision Making
 - i. MHD: Chap. 5 RMD: Chap. 18
- i. Week 9 Conflicting Objectives
 - i. MHD: Chap. 15 RMD: Chap. 10
- j. Week 10 Formal Risk Assessment
 - i. MHD: Chap. 9, 11 RMD: Chap 15