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

   h. Office Hours: By appointment
   i. Phone: 503-680-7653
   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 [9] (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. 291-280 : C-
        ix. 279-268 : D+
        x. 267-240 : D
        xi. 239-000 : 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 [Jan 7]: Reading
    b. Week 2: [Jan 14]: Reading / Written Assignment #1
    c. Week 3: [Jan 21]: Reading / Written Assignment #2
    d. Week 4: [Jan 28]: Reading / Written Assignment #3
    e. Week 5: [Feb 4]: Reading / Mid Term / Written Assignment #4
    f. Week 6: [Feb 11]: Reading / Written Assignment #5
    g. Week 7: [Feb 18]: Reading / Written Assignment #6
    h. Week 8: [Feb 25]: Reading / Written Assignment #7
    i. Week 9: [Mar 3]: Reading / Written Assignment #8
    j. Week 10: [Mar 10]: Reading / Written Assignment #9
    k. Week 11: Finals Week

7. **Tentative Week Topics and General Reading [Specifics 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. 13 RMD: Chap. 10
    j. Week 10 Formal Risk Assessment
        i. MHD: Chap. 9, 11 RMD: Chap 15