ECE/ENGR 531  
Engineering Risk Analysis

Learning Objectives

After Session 1, the student should be able to:
- Articulate the course objectives, syllabus and course schedule, text book, prerequisites, grading, course policies, example applications, instructor, and teaching assistant information.
- Organize the topics in each week of the course and how they relate to chapters in the text book.
- Define risk and motivate this definition.

After Session 2, the student should be able to:
- Describe the components of the standard risk model, used in the Smith-Merritt risk management approach.
- Discuss alternative risk models and their relative advantages and disadvantages.

After Session 3, the student should be able to:
- Describe the five-step risk management process of Smith & Merritt.
- Explain each step of the process and how they relate to one another.

After Session 4, the student should be able to:
- Provide an overview of the first step of the risk management process: Risk identification.
- Describe in detail what is involved in this step.
- Provide practical pointers for how to do it effectively.
- Discuss some pitfalls that can arise.

After Session 5, the student should be able to:
- Provide an overview of the second step of the risk management process: Risk analysis.
- Describe in detail what is involved in this step.
- Provide practical pointers for how to do it effectively.
- Discuss some pitfalls that can arise.

After Session 6, the student should be able to:
- Provide an overview of the third step of the risk management process: Risk prioritization and mapping.
- Describe in detail what is involved in this step.
- Provide practical pointers for how to do it effectively.
- Discuss some pitfalls that can arise.
After Session 7, the student should be able to:
- Provide an overview of the fourth step of the risk management process: Risk resolution planning.
- Describe in detail what is involved in this step.
- Provide practical pointers for how to do it effectively.
- Discuss some pitfalls that can arise.

After Session 8, the student should be able to:
- Provide an overview of the fifth step of the risk management process: Risk monitoring.
- Describe in detail what is involved in this step.
- Provide practical pointers for how to do it effectively.
- Discuss some pitfalls that can arise.

After Session 9, the student should be able to:
- Provide an overview of some tools to support risk management: sticky density, spreadsheets, decision analysis, risk simulation, and design structure matrix.
- Describe in detail what is involved in using each of these tools.
- Provide practical pointers for how to use each tool effectively.
- Discuss some pitfalls that can arise.

After Session 10, the student should be able to:
- Describe several strategies to improve risk management effectiveness: Avoiding risk when no value added, staying flexible on unresolved issues, maintaining contact with customers, addressing risky items first, apportioning risk, testing at low level, and using failure to your advantage.
- Provide practical pointers for how to implement these strategies.
- Discuss some pitfalls that can arise.

After Session 11, the student should be able to:
- Discuss implementing a project risk management program successfully.
- Provide practical pointers for developing a risk management culture at the organizational level.
- Discuss some pitfalls that can arise.

After Session 12, the student should be able to:
- Discuss the two case studies in Chapter 12 on implementing the risk management process: manufacturing ramp-up and embedded software development.
- Describe the five-step risk management process as applied in these two case studies.

After Sessions 13 and 14, the student should be able to:
- Present their semester projects to an audience of peers.
- Assess the presentations of their peers.
- Provide a written report of their semester projects.