

SYLLABUS



CE599: Special Topics – *Project Risk Management (3 units)* Spring 2018

Location: KAP 140

Meetings: Thursday, 3:30pm-6:10pm

Professor: David B. Ashley
KAP 238A

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Office Hours: Office hours are available by appointment. The preferred day and time for appointments is Thursday morning, and this time window will be generally available. Other times may be arranged for mutual convenience. Students should contact the instructor at least two days before the desired appointment to confirm meeting times.

TA: TBD

Text/Materials: A selection of required readings will be made available on the *Blackboard* course management system. The readings will include material on decision analysis, fault-tree analysis and risk communication. Example risk management program manuals from public agencies will also be available. Students will be expected to obtain academic versions of the *DecisionTool Suite™* software from Palisade Corporation (\$50, downloaded directly from the company site). The textbook (required) for the course is:

Managing Risk in Construction Projects, 3rd Edition, By Nigel J. Smith, Tony Merna and Paul Jobling, Published February 2014, Wiley-Blackwell, 252 pages.
ISBN: 978-1-118-34723-2

Prerequisite: Graduate student standing required unless otherwise agreed upon by instructor. Students are expected to have a basic understanding of probability and/or statistics.

Course Description: *Project Risk Management* is an advanced-level, graduate course designed especially for civil, environmental and construction students. Other disciplines involved in creating the built environment (e.g., architecture, urban planning, power systems engineering) or technology-based management (e.g., business, research and development) are welcome. The focus will be on identifying and managing risks at the project level – the project could be a major architectural-engineering-construction (AEC) project, a civil-infrastructure project, or even development of a new/innovative technology. A variety of risk analysis concepts, tools and methodologies will be utilized. One major project and five exercises will be prepared and presented by student groups. A single, mid-term exam will also be given to assess each student's understanding of basic risk analysis concepts and methodologies.

Modern, engineering-driven projects are often large, complex and risky. With a special emphasis on built facilities and infrastructure projects, this course develops tools and methodologies appropriate for decision making under uncertainty. The course will focus primarily on initial project delivery strategies (i.e., role of participants, type of contracting, contract design, project financing approach, and distribution of risks). These strategies require the project sponsor/owner to understand and identify the risks, consider alternate contracting and financing options, and develop contingencies. Risk identification and decision-theory tools are used to help select a best strategy and to manage risks throughout the project. The current state-of-the-practice approaches are also discussed.

Course Objectives: *Project Risk Management* is a graduate course on an advanced topic. Lectures cover both the theory and application of decision theory to project management. The overall goal of the course assignments is to promote application of the basic decision analysis tools to real project situations.

The primary course learning objectives are for the student to have:

- A broad knowledge of risk concepts, principles and terminology;
- A good comprehension of how major project risks are identified and assessed;
- An understanding of specific risk analysis methodologies and the ability to apply them in practice;
- An understanding of capital project program and pre-construction strategies and approaches; and
- An up-to-date knowledge of risk management best practices in the AEC industry.

Assignments: Students will be responsible for preparing and submitting assignments as follows:

- Five group exercises will be used to reinforce the basic concepts, methodologies and current practices. The expected assignments may be selected from the following:
 - ✧ *Influence diagram* for a major project or decision,
 - ✧ *Fault-tree* and *fishbone* analyses of a system that may fail,
 - ✧ *Risk communication* review and evaluation,
 - ✧ Development of a *Project risk model* using *@Risk*,
 - ✧ *Currency exchange risk analysis*,
 - ✧ *Political risk analysis* for an international project, or
 - ✧ Review of the *CalTrans Risk Management Program* and development of a *Risk Management Plan* for an example project.
- Group term project – Students will work in small groups on a semester-long risk analysis/management project. The project will be defined and secured by the students. It should be a real (or “realistic”) project involving a major capital project (or

engineering-driven business) decision involving significant uncertainty. The decision(s) should be prospective (looking forward) and represent a strategic action to be taken. Examples of reasonable decisions include building an extension to a light-rail transit line, adding floors to an existing campus building, developing a desalination facility on the coast of California, or creating a new solar-energy collection facility in the California desert. Each group will make a mid-term and a final presentation of its project, and will produce a final, professional report.

- Mid-term exam - The mid-term exam will test each student on fundamental probability and decision theory concepts, as well as his/her ability to apply those concepts to example problems.

Presentation/Session Schedule:

Week	Topic	Comments and Preparation
1	Course introduction, probability and decision-analysis basics	
2	Risk analysis methodology concepts and application	
3	Risk analysis methodology application and extensions	Exercise #1 due
4	Other modeling approaches (including fault trees and fishbone diagrams)	
5	Risk software (@Risk)	Exercise #2 due
6	Risk communication	
7	Mid-term Exam	
8	Forensic risk management and expert witness	Exercise #3 due
9	Group presentations & PMI Book of Knowledge – Risk Management	Mid-term, in-class presentation of group project due
10	Risk registers, risk charters and risk management plans	Exercise #4 due
11	Engineering contracts, project delivery strategies and international project risks	
12	Risk planning and management case studies (including the Panama Canal Expansion Program)	Exercise #5 due
13	Management of risk in the AEC industry – extensions of the risk concepts	
14	Best Practices: Management of risk in the AEC industry	
15	Group presentations & Course wrap-up	Final, in-class presentation of group project due
		Group project final report due

Grading: Grade components will be weighted as follows in the computation of the final course grade:

Group Exercises (5 at 8% each)	40%
Group Term Project	50%
Mid-term Quiz	10%
TOTAL	100%

Course Policies:

Quizzes -- There will be **NO** final exam. Each student is expected to take the mid-term exam on the date scheduled; any deviation from this timing must be approved by the instructor in advance.

Course Project -- The term-long project is the most important deliverable for the course and must include the two scheduled in-class presentations. Each student in a group will receive the same grade based on the assessment of the final project report and two presentations. It is the responsibility of the groups to manage their own interactions and individual participation.

Class Participation and Attendance -- It is important that you are familiar with the course materials as the course evolves; regular attendance is expected. Each student is responsible for all materials and administrative instructions given during the lecture period.

Assignment and project submittals – ALL assignment submittals will be made electronically directly in the *Blackboard* course management system. Each assignment/group project item due will have a corresponding “Assignment” in the *Blackboard* system; this is the only mechanism for accepting the submittals. The system automatically identifies items submitted late and any late items are subject to grade reductions.

Personal Problems -- If you have illness or personal problems that will affect your performance during the course of the semester, please let the instructor know as soon as possible. “After the fact” notification is unacceptable unless there are extreme circumstances.

Statement for Return of Course Assignments and Materials – All assignments are to be submitted electronically in *Blackboard* and all assignment/project materials and evaluation information will be available only through this system. The mid-term exam will be graded and returned to the student.

Statements on Academic Conduct and Support Systems (per USC Policy):

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” <https://policy.usc.edu/scampus-part-b/> . Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct> .

Support Systems:

Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

<https://engemannshc.usc.edu/counseling/>

National Suicide Prevention Lifeline - 1-800-273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class.

<https://equity.usc.edu/>

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. <https://studentaffairs.usc.edu/bias-assessment-response-support/>

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations.

<http://dsp.usc.edu>

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. <https://studentaffairs.usc.edu/ssa/>

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students.

<https://diversity.usc.edu/>

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, <http://emergency.usc.edu>

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime. Provides overall safety to USC community.

<http://dps.usc.edu>