College of Engineering

Department of Civil Engineering

CE 514 Decision Making and Risk Management in Construction

Credit and Contact hours	3 / 3 (Lectures), 0 (Tutorials), 0 (Laboratory)
Required, or Elective	Required
Course Description	Concepts and current issues surrounding construction project evaluation and financing. The use of decision theory in evaluating project feasibility studies. Decision making under conditions of risk and uncertainty.
Prerequisites or Co-requisites	None
Course Learning Outcomes	Students completing this course successfully will be able to:

Course Learning Outcomes (CLOs)	*Related Student Outcomes (SO)*
CLO1. Acquiring critical knowledge of contemporary risk management techniques in the construction industry. K1	**SO1**
CLO2. Use different decision-making techniques to solve real-life construction related problems. S1	**SO2**
CLO3. Develop a detailed risk management plan using different tools and approaches and suggest mitigation response. S1	**SO2**
CLO4. Discuss recent advancements in risk management plans in complex projects and identify any gaps needed for future research. S3	**SO4**

Student Outcomes related to this Course

SO 1 Recognize advanced engineering knowledge, concepts, and techniques to identify, interpret, and analyze complex and real-life engineering problems.

SO 2 Provide solutions for complex and real-life engineering problems through critical thinking and the use of modern engineering tools, and identify their impact on social, global, cultural, environmental, safety, and economic factors.

SO 4 Criticize and discuss scientific research reports /papers related to Civil Engineering issues with a high level of ethics proficiency and communication skills, independently, or as a teamwork.

Topics Covered	**List of Topics** — **Related CLOs** 1. Introduction to projects, risks, and decision-making techniques — **CLO 1** 2. The Analytic Hierarchy Process (AHP) — **CLO 2** 3. Decision tree — **CLO 2** 4. Fuzzy logic and SWOT analysis — **CLO 2** 5. Risk management — **CLO 3** 6. Qualitative and Quantitative approaches — **CLO 1 & 3** 7. Risk allocation and accountability — **CLO 1 & 3** 8. Monte Carlo simulation — **CLO 4** 9. Case studies — **CLO 4**
Textbook(s) and Other Required Material	• Singh, Amarjit, and C. Eng. "Quantitative Risk Management and Decision Making in Construction." American Society of Civil Engineers, 2017. 304)
Grading System	Assignments 20% Project work and research report 20% Mid-term exams 20% Final Exam 40%
Instructors	Dr. Abdullah Alsharef
Date of Review	March, 2025