Risk Management in Construction

Code	Credit Hours
CEM-807	3-0

Course Description

The course is designed to elevate students' understanding of the systematic approach to managing risks within construction projects, introducing a comprehensive risk management framework. The curriculum encompasses both qualitative and quantitative analysis tools and methods, including soft systems methodology, Monte Carlo Simulation, multi-attribute decision-making tools, and sensitivity testing. Through the examination of case studies drawn from the construction industry, the course demonstrates the practical application of risk management principles and techniques. Upon successful completion, students will be proficient in assessing, controlling, and transferring risks throughout the project lifecycle, employing mathematical models based on probabilistic and statistical methods, and simulating risk identification, analysis, and mitigation. Furthermore, students will gain a thorough understanding of current risk management practices utilized in the construction sector.

Textbook(s):

1. Smith, N. J., Merna, T., & Jobling, P. (2006). “Managing Risk in Construction Projects” (2nd ed.). Blackwell Publishing.

Reference Book(s):

1. Flanagan, R., and Norman, G. (1993). “Risk Management and Construction.” Wiley-Blackwell.
2. Codrons, B. (2006). “Probability and Risk Analysis: An Introduction for Engineers.” Springer.

Prerequisites

CE 371 (Construction Project Management)

ASSESSMENT SYSTEM FOR THEORY

Quizzes	10%
Assignments	10%
Mid Terms	25%
Term Project	10%
ESE	45%

Teaching Plan

Week No.	Topics	Learning Outcomes
1	Introduction	Course outline, objectives, teaching plan, assessment methods, and review of key concepts.
2-6	Risk and Uncertainty in Projects, Risk Management Terminology, and Maturity	Understand risk and uncertainty in the construction process. Learn risk management terminology, diagnose risk management maturity, and explore contemporary debates in risk management. Understand the risk and opportunity management process.
7-8	Risk and Opportunity Identification	Identify risks and opportunities in construction projects. Understand the role of contracts in risk and opportunity identification. Learn various risk identification techniques, including proactive and reactive methods.
9	**MID-TERM EXAM**	
10-13	Risk and Opportunity Analysis	Conduct risk and opportunity analysis using quantitative, qualitative, and semi-quantitative methods. Differentiate between these methods and apply them to construction projects. Learn and apply probability concepts and Monte Carlo Simulations for risk quantification and management.
14-16	Perceptions of Risk, Risk Response, Crisis Management, and Implementation of Risk and Opportunity Management Systems	Explore the psychology of risk, including personal and reporting biases. Learn techniques to eliminate biases in risk assessment and management. Develop strategies for risk response, including doing nothing, risk avoidance, risk reduction, and elimination. Understand crisis management planning and recovery. Create and communicate a risk and opportunity management policy. Implement a risk and opportunity management system. Understand and implement the Risk and Opportunity Management System (ROMS), conduct audits, and understand the benefits of the system.
17	Risk management plan	Students should be able to make a risk management plan for the complete project. Presentation to be given along with submission of project for a case study project.
18	**End Semester Exams**	