

John M. Thompson Centre for Engineering Leadership and Innovation

ELI 9110 – Risk Assessment and Management

Course Outline Winter 2026

Course Instructor:

LECTURE	3 hours per week
LAB or TUTORIAL:	N/A
OFFICE HOURS *if applicable	Provided on Brightspace
ANTIREQUISITE(s):	N/A
PREREQUISITE(s):	Completion of 3 rd year of BSc in Engineering
CEAB Academic Units:	Engineering Science 100%
TEXT / Course Resources / References	No textbook. All course material will be posted to Brightspace
DESCRIPTION This course provides a comprehensive understanding of risk management in engineering projects, emphasizing the identification, assessment, evaluation, reporting and mitigation of risks. Students will learn to apply various risk management techniques, use quantitative and qualitative methods for risk assessment, and develop risk communication strategies. The course combines theoretical concepts with practical case studies, preparing students to manage risks effectively in complex engineering environments.	

Course Learning Outcomes	CEAB GA
1. Risk Identification: Identify and categorize potential risks in engineering projects, considering technical, environmental, financial and social factors	PA1, ITW2, LL1
2. Risk Assessment and Analysis: Conduct qualitative and quantitative risk analysis to determine the likelihood and impact of identified risks	PA2, ET1, ET2, ITW1-2
3. Risk Evaluation: Apply risk evaluation techniques to evaluate the causes and effects of risks and prioritize identified risks	PA3, IESE1
4. Risk Treatment: Develop and implement strategies to mitigate, transfer, avoid or accept risks in engineering projects.	PA3, IESE1
5. Risk Monitoring and Review: Familiarize with risk monitoring systems to track risk status and effectiveness of mitigation strategies over time.	LL1
6. Risk Communication and Reporting: Effectively communicate risk information to various stakeholders using appropriate tools and techniques.	CS1-3
7. Risk Governance: Understand and apply risk governance principles and frameworks such as ISO 31000 to guide risk management practices in engineering organizations.	P1, IESE1
8. Risk Management Plan: Develop risk management plan for an engineering project or company implementing components of risk management framework	PA1-3, ET1-2, ITW2, IESE1, LL2

Graduate Learning Objectives (CEAB Graduate Attributes)

Degree Level Expectation	Weight	Assessment Tools	Learning Outcomes
Depth and breadth of knowledge	30%	<ul style="list-style-type: none"> Quizzes/Midterm Research Paper Project 	Understand of course and advanced risk management concepts Identify current and emerging risks in engineering Apply qualitative and quantitative risk assessment methods
Research & scholarship	10%	<ul style="list-style-type: none"> Research Paper 	Critically evaluate literature on emerging risks, risk assessment and management
Application of knowledge	30%	<ul style="list-style-type: none"> Quizzes/Midterm Research Paper Project 	Apply risk identification, assessment and evaluation methods to analyze engineering risk scenarios Develop and justify risk treatment strategies Design context-specific risk management plan including risk monitoring and communication strategies
Professional capacity / autonomy	5%	<ul style="list-style-type: none"> Research Paper Project 	Apply academic integrity and ethical reasoning in risk-based decision making Justify proposed approaches in risk management
Communication skills	15%	<ul style="list-style-type: none"> Group Project Research Paper Class contribution 	Clearly articulate risk concepts and analysis Prepare well-structured written risk reports and deliver effective oral presentations
Awareness of limits of knowledge	10%	<ul style="list-style-type: none"> Class contribution/ Brightspace surveys 	Identify and explain limitations of data, models and assumptions in risk assessment and management Recognize stakeholder input and complexity of risk decision making

Course Assessment

Name	% Worth	Tentative Date	Learning Outcomes (GA)
Class Contribution	10%	Ongoing	1-8 (ITW1, ITW2, LL1-2)
Quizzes	10 % (5 % x 2)		1-2, 4-6 (PA1-3, ET 1-2 IESE1)
Midterm	20%		1-3 (PA1-3, ET 1-2, IESE 1)
Research Paper	30%		1-4 (ITW1, PA3, CS2)
Group Project	30%		1-8 (CS2-3, ITW2, PA1-3, ET 1-2)

Course Style:

This course adopts a collaborative learning model with the group project designed as a continuous escape game. Students take on the role of risk management consultants, progressing through weekly "levels" by applying theoretical concepts of risk management framework to create risk management plan for a real-world project. The course emphasizes interdisciplinary thinking, teamwork, stakeholder engagement, and strategic decision-making, all crucial for managing complex engineering risks effectively.

Classes are primarily discussion-based, with a focus on group activities, case studies, and ideation sessions. Students are expected to come prepared to actively participate. The instructor will mentor and guide students through individual and collective learning processes aligned with course objectives. Through

research, hands-on exercises, and presentations, students will progressively apply theoretical key risk management components in a realistic and evolving context, fostering a dynamic and interactive learning environment.

Class Contribution

It is important to differentiate between class participation and contribution. Class participation focuses on you, whereas class contributions focus on the benefits you accrue to the class. As this is a collaborative style course, you are expected to engage with the class process in order to contribute to the class discussions and the collective learning of the class. Each student is expected to participate and contribute each week. In order to do so, you should listen actively to the class conversation, ask questions of your classmates, offer insights, and contribute meaningfully. It also means that you are respectful of your classmates and their opinions, are punctual and attentive, and do not engage in negative or disruptive behaviours.

Quizzes and Midterm

Two quizzes and one midterm examination will be scheduled during the lecture periods.

Research paper

Students will submit an independent research paper including literature review, original analysis and critical evaluation of current practices in risk management using peer-reviewed sources. The paper can be focused on current or novel methods for risk identification, analysis and evaluation or on emerging risk topics (AI ethics, emerging technologies, climate change).

Plagiarism on Assignments: Students must hand in an assignment that contains only their own work. If an assignment is deemed to be similar to another from this year (in the opinion of the TA and the Prof.) this will be taken as a case of plagiarism. In such circumstances, both individuals (e.g., the person providing the answer and the person copying it) will both receive a mark of zero on the entire assignment.

Group Project

Within a group, students will act as a consulting team tasked with developing risk management plan for a specific engineering scenario. The project is designed to integrate various components of risk management, including risk identification, risk analysis, risk evaluation, risk treatment, risk monitoring, risk communication, risk reporting and risk governance. Students will conduct a detailed risk assessment, evaluate identified risks, and propose effective treatment strategies. Students will work on different project challenges related to particular risk management component. The final project deliverables will include group presentation and a detailed report.

CHEATING, PLAGIARISM/ACADEMIC OFFENCES

Academic integrity is an essential component of learning activities. Students must have a clear understanding of the course activities in which they are expected to work alone (and what working alone implies) and the activities in which they can collaborate or seek help; see information above and ask instructor for clarification if needed. Any unauthorized forms of help-seeking or collaboration will be considered an academic offense. University policy states that cheating is an academic offence. If you are caught cheating, there will be no second warning. Students must write their essays and assignments in their own words. Whenever students take an idea or a passage of

text from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence. Academic offences are taken seriously and attended by academic penalties which may include expulsion from the program. Students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence at the following website: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

CONDUCT

Students are expected to follow proper etiquette to maintain an appropriate and respectful academic environment. Any student who, in the opinion of the instructor, is not appropriately participating in course activities and/or is not following the rules and responsibilities associated with the course activities, will be reported to the Associate Dean (Graduate) (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Associate Dean (Graduate), the student could be debarred from completing the assessment activities in the course as appropriate.

HEALTH/WELLNESS SERVICES

As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Western provides several health and wellness related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. Information regarding health- and wellness-related services available to students may be found at <http://www.health.uwo.ca/>.

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Faculty of Engineering has a Student Wellness Counsellor. To schedule an appointment with the counsellor, contact Kristen Edwards (khunt29@uwo.ca) via confidential email and you will be contacted by our intake office within 48 hours to schedule an appointment.

Students who are in emotional/mental distress should refer to Mental Health Support at <https://www.uwo.ca/health/psych/index.html> for a complete list of options about how to obtain help.

SICKNESS

Students should immediately consult with the Instructor (for a particular course) or Associate Chair (Graduate) (for a range of courses) if they have problems that could affect their performance. The student should seek advice from the Instructor or Associate Chair (Graduate) regarding how best to deal with the problem. Failure to notify the Instructor or the Associate Chair (Graduate) immediately (or as soon as possible thereafter) will have a negative effect on any appeal. Obtaining appropriate

documentation (e.g., a note from the doctor) is valuable when asking for accommodation due to illness.

Students who are not able to meet certain academic responsibilities due to medical, compassionate or other legitimate reason(s), could request for academic consideration. The Graduate Academic Accommodation Policy and Procedure details are available at:

<https://www.eng.uwo.ca/graduate/current-students/academic-support-and-accommodations/index.html>

Please note that any academic considerations granted in this course will be determined by the instructor, in consultation with the academic advisors in your Faculty of Registration, in accordance with information presented in this course outline.

ACCESSIBLE EDUCATION WESTERN (AEW)

Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program. Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are strongly encouraged to register with Accessible Education Western (AEW): http://academicsupport.uwo.ca/accessible_education/index.html

AEW is a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AEW and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

STATEMENT ON GENDER-BASED AND SEXUAL VIOLENCE

Western is committed to [working to end gender-based and sexual violence on campus and in our community](#) and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced gender-based or sexual violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts, [here](#). To connect with a case manager or set up an appointment, please contact support@uwo.ca.