

Module Code	ME5MM7
Module Name	RISK MANAGEMENT AND SAFETY ASSESSMENT SYSTEMS
ECTS Weighting¹	5 ECTS
Semester taught	Semester 1
Module Coordinator/s	Professor Garret O'Donnell (Garret.ODonnell@tcd.ie), Professor Kevin O'Kelly (okellyk@tcd.ie),
<u>Module Learning Outcomes</u> with reference to the <u>Graduate Attributes</u> and how they are developed in discipline	<ol style="list-style-type: none"> 1. Understanding the role of risk in decision making in major projects 2. Risk quantification techniques for techno-economic evaluation of projects 3. Develop a conceptualization of System Safety Engineering considering an historical perspective 4. Know the main references in relation to legislative framework requiring Risk Assessment and Safety Management System in industry 5. Be able to use the main engineering methods for Risk Assessment (e.g. HAZID, HAZOP, FAULT TREES, EVENT TREES, BOW TIES etc.)
Module Content	<p>The aim of the module is to expose the students to the issue of risk and the impact of risk in two main aspects of engineering. First the domain of project management and the role risk plays in engineering decision making. Second is the evaluation of fundamental criteria and the methodological approaches for the design and management of system safety approaches for industrial operations, for production and service, in the view of minimization of operational risks.</p> <p><u>Project</u></p> <ul style="list-style-type: none"> • Contextualising project risk in terms of impact on delivery of large scale infrastructure/capital projects • Organisational and human factor aspects to risk perception in project and task planning • Quantification of risk in project planning and delivery • Case studies in impact of poor risk management in projects <p><u>Safety</u></p> <ul style="list-style-type: none"> • Operational Risk Management from an historical and legislative perspective (Fundamentals and Principles of Industrial Safety and Health Occupational, Compliance and laws on prevention of occupational risks/standards CE etc.) • System Safety Engineering in Industrial applications examples (types of risks workers are exposed to) • Hazard identification, according to the activity and the workplace

¹ [TEP Glossary](#)

- Engineering methods for risk assessments (HAZID, HAZOP, FT, ET, BOWTIE)

Graduate Attributes: levels of attainment

To act responsibly - Attained

To think independently - Enhanced

To develop continuously - Enhanced

To communicate effectively – Attained

Teaching and Learning Methods

This module is typically a modest group size environment and may be subdivided as necessary for group project activity/discussion. Hence the class forms the basis for discussion on topics, as well as more formal podium style lectures. Examples related in the class are often research led through discussion on leading research projects. Visiting/guest lectures include industry domain specialists e.g. safety managers as well as visiting researchers specialising in risk in industrial systems. This model will be used as much as possible using online tools such as Blackboard, but attendance is mandatory as discussion topics are critical to the learning outcomes.

There is continuous assessment for both elements of the course.

Assessment Details² Please include the following: <ul style="list-style-type: none"> • Assessment Component • Assessment description • Learning Outcome(s) addressed • % of total • Assessment due date 	Assessment Component	Assessment Description	LO Addressed	% of total	Week due
	Examination	Individual	all	60%	Wk12
	Assignments	Topical, independent work	all	40%	Wk12
Reassessment Requirements	Examination only				
Contact Hours and Indicative Student Workload²	Contact hours: 33 Hours				
	Independent Study (preparation for course and review of materials):33				
	Independent Study (preparation for assignment, incl. completion):33				
Recommended Reading List	<p>System Safety Engineering and Risk Assessment: A Practical Approach, Second Edition</p> <p>Engagement with topics and up-to-date sources such as HSA (Health and Safety Association), National Capital Project reviews and reports on topical issues, e.g. National childrens hospital CCPC (Competition and Consumer Protection Commission)</p>				
Module Pre-requisite	Recommended: Advanced Manufacturing modules, Supply Chain Management or equivalent from visiting institutions				
Module Co-requisite	Na				
Module Website	Blackboard TCD				
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.	No				
Module Approval Date	28-08-2025				
Approved by	Nicole Byrne				
Academic Start Year	2025				
Academic Year of Date	2025-2026				

² [TEP Guidelines on Workload and Assessment](#)

