Subject Description Form

Subject Code	CSE49444
Subject Title	Risk Assessment and Management
Credit Value	3 Academic Credits
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	To provide students with knowledge of risk quantification and modelling, in the risk assessment and management process, when integrating various issues including perceptions, communication, and cost-effectiveness.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) demonstrate a basic knowledge of the concepts of risk, recognize risk management as a key business function, and organize and make use of information from multiple disciplines; b) define the role of risk management in the context of occupational safety and health, and formulate effective risk control strategies; c) conduct risk assessment and construct probability distributions based on available information; d) quantify risk exposure, develop and apply dose/response functions, and to address uncertainty and variability, when evaluating the risks to provide a basis for decision making; e) define the role of insurance in the context of risk management; and f) understand capabilities and limitations of risk assessments, identify the objectives of risk communication, and develop effective risk communication strategies and emergency plan.
Subject Synopsis/ Indicative Syllabus	1. <u>Introduction to Risk</u> A comprehensive definition of risk. Concept of certainty, uncertainty and risk. Types of risk (hazard risks, control risks and opportunity risks).

	2. Holistic Risk Management Styles of risk management: hazard management, control management, opportunity management. Model of the business cycle; embedding risk management into the business cycle. 3. Risk Perceptions and Human Behaviour Introduction to behavioural safety. Risk perception, risk acceptance and risk preparedness. Safety culture. Change management. 4. Risk Assessment Risk assessment process. Hazard identification techniques, risk rating technique and decision analysis tools.. 5. Risk formulation Risk assessment algorithm for risk estimates will be used as an example to illustrate the unit risk factors for analysis of inhalation risk and potency factors for ingestion risk. 6. Exposure Exposure concept, exposure assessment measurement and estimation, multipathway exposure 7. Risk estimation and measures Prioritization for regulatory risk assessment, regulatory risk estimation, loss of life expectancy and other risk measures, and comparative risk assessment 8. Insurance Risk transfer by insurance. Risk control and risk financing. 9. Risk Management and Communication Risk management principles, strategies for managing and control of risk, rationale for the need to communicate about hazard risks, risk communication strategies.
Learning Methodology	A series of lectures will be given to introduce the principles of risk assessment and management. Assignments should be finished by students in order to fully capture the main contents of this course. Tutorials will provide a platform for students to solve any problems relating to the contents of the lecture. Case study includes preparation of presentation and report. Students should make critical literature reviews cooperatively about risk assessment and management cases.

Assessment Methods in Alignment with Intended Learning Outcomes

Assessment Methods	Weighting (%)	Intended Learning Outcomes Assessed					
		a	b	c	d	e	f
1.Case study report and assignments	40	✓	✓	✓	✓		✓
2.Examination	60	✓	✓	✓	✓	✓	✓
Total	100						

Students must pass the final examination and achieve a passing overall score/ grade to pass the subject.
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The continuous assessment components include a case study report and set of questions. They require students to study risk assessment and management cases and questions from the perspectives of basic risk concepts, risk control strategies, risk assessment, risk evaluation, and risk communication strategies. Based on these exercises, students' ability to apply and synthesize acquired knowledge can be assessed through the quality of their written reports and presentations on the case studies.

The final examination is used to gauge how much students have understood the overall subject contents and to assess students' achievement of all learning outcomes.

Student Study Effort Required

Class Contact	
▪ Lecture	26 Hrs.
▪ Tutorial	13 Hrs.
Other Study Effort	
▪ Coursework	39 Hrs.
▪ Self-study	39 Hrs
Total Study Effort	**117 Hrs.**

Reading List and References

Essential Textbook:

1. Williams, C.A., 1998, "Risk Management & Insurance", 8th Edition, McGraw-Hill

2. Hopkin P., 2002, *Holistic Risk Management in Practice*, Witherby & Co. Ltd.

3. Lawrence B. Gratt Air Toxic Risk Assessment and Management, Van Nostrand Reinhold, 1996.

	Reference Textbooks: 1. AS ISO 31000:2018, “Risk Management - Guidelines ”, Standards Australia 2. BS ISO 45001:2018, “Occupational Health and Safety Management Systems”, British Standards Institution, BSI 3. Brauer, R L 2016, “Safety and Health for Engineers”, 3rd edition, Wiley 4. Dickson, G.C.A, 2003, “Risk Analysis”, 3rd edition, Witherby & Co. Ltd. 5. Health and Safety Executive, HSE, 2018, HSG48 “Reducing Error and Influencing Behaviour”, 2nd edition, The Stationery Office, TSO 6. Rejda, G.E., 2016, “Principles of Risk Management & Insurance”, 13th Edition, Pearson 7. Viner, D., 2016, “Occupational Risk Control: Predicting and Preventing the Unwanted”, Routledge 8. Air Toxics And Risk Assessment, Kenyon E. M., Lewis 1990, (RA576.5 C35, 1990) 9. C. Richard Cothern, Comparative Environmental Risk Assessment, Lewis Publishers, 1992 10. Handbook Of Air Toxics: Sampling, Analysis And Properties, K. Lawrence, Lewis, 1995. 11. John Frawley, Risk Assessment and Environmental Fate Methodologies, Council for the Health and Environmental Safety of Soils (CHESS), USA, 1992