

Subject Description Form

Subject Code	CSE532
Subject Title	Risk Assessment and Management
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	a. To learn the basic risk assessment process for human health impacts from various toxic emissions. b. To quantify multipathway exposure assessment measurement and estimation. c. To integrate various risk issues, perceptions and communication, health risk assessment and management process, cost-effectiveness, and risk modeling.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. organize and make use of information from multiple disciplines; b. quantify pollutant transport and human exposure; c. construct probability distributions with limited data; d. develop and apply dose/response functions and to address uncertainty and variability; and e. understand capabilities and limitations of risk assessments.
Subject Synopsis/ Indicative Syllabus	<u>Keyword Syllabus</u> i) <u>Introduction to Risk Assessment</u> Basic risk assessment process for human health impacts from various toxic emissions. ii) <u>Health risk formulation</u> The screening risk assessment algorithm for cancer 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. iii) <u>Exposure</u> Exposure concept, exposure assessment measurement and estimation, multipathway exposure.

	iv) <u>Dose-response, Epidemiology, and Pharmacokinetics</u> Dose and dose scaling, short-term test vs. long term test, low dose extrapolation models, comparison of dose-response models and multicompartment model. v) <u>Risk estimation and measures</u> Prioritization for regulatory risk assessment, regulatory risk estimation, loss of life expectancy and other risk measures, and comparative risk assessment. vi) <u>Risk management</u> Risk issues, perceptions and communication, health risk assessment and management process, cost-effectiveness, and risk modelling.																																															
Teaching/Learning Methodology	A series of lectures will be given to introduce the principles of risk assessment and management. The lectures will cover hazard characterization, source and emissions, exposure assessment, and dose/response functions. Simultaneously, two 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	<table><tr><th rowspan="2">Specific assessment methods/tasks</th><th rowspan="2">% weighting</th><th colspan="5">Intended subject learning outcomes to be assessed</th></tr><tr><th>a</th><th>b</th><th>c</th><th>d</th><th>e</th></tr><tr><td>1. Assignment</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>2. Mid-term</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>3. Group project</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>4. Final Exam</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>Total</td><td>100%</td><td colspan="5"></td></tr></table> Students must pass the final examination and achieve a passing overall score / grade to pass the subject.	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed					a	b	c	d	e	1. Assignment	10%	✓	✓	✓	✓	✓	2. Mid-term	10%	✓	✓	✓	✓	✓	3. Group project	20%	✓	✓	✓	✓	✓	4. Final Exam	60%	✓	✓	✓	✓	✓	Total	100%					
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4. Final Exam	60%	✓	✓	✓	✓	✓																																										
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Student Study Effort Expected	Class contact:	
	▪ Lecture	39 Hrs.
	Other student study effort:	
	▪ Reading and Studying	59 Hrs.
	▪ Completion of Assignment	20 Hrs.
	Total student study effort	118 Hrs.
Reading List and References	<u>Textbook</u> Lawrence B. Gratt <i>Air Toxic Risk Assessment and Management</i>, Van Nostrand Reinhold, 1996. <u>Reading list</u> <i>Air Toxics And Risk Assessment</i>, Kenyon E. M., Lewis 1990, (RA576.5 C35, 1990). C. Richard Cothorn, <i>Comparitative Environmental Risk Assessment</i>, Lewis Publishers, 1992. <i>Handbook Of Air Toxics: Sampling, Analysis And Properties</i>, K. Lawrence, Lewis, 1995 (TD890 K4 1995). John Frawley, <i>Risk Assessment and Environmental Fate Methodologies</i>, Council for the Health and Environmental Safety of Soils (CHESS), USA, 1992.	