[Course Title] Modeling Systems with Uncertainties

[Course Code] CIVL 2160

[No. of Credits] 3

[Any pre-/co-requisites] None

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Office Hours: Two tutorials per week, as listed on websites.

Course Description

Identification and modeling of non-deterministic problems in civil engineering, and the treatment thereof relative to engineering design and decision making. Development of stochastic concepts and simulation models, and their relevance to real design and decision problems in various areas of civil engineering.

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

1. Provide students with fundamental knowledge in uncertainty, probability and statistics

2. Identification and modeling of non-deterministic problems in civil engineering, and the treatment thereof as related to engineering design and decision making

3. Development of stochastic concepts and probability models, and their relevance to design and decision problems in various areas of civil engineering

4. Introduction to engineering problem solving involving inherent uncertainties via probabilistic modelling and statistical tools

5. Provide students with basic simulation skills to solve realistic engineering problems effectively

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation.

Assessments:

Assessment Task	Contribution to Overall Course grade (%)	Due date
Mid-Term	32%	TBD
Homework	36% (6 assignments)	TBD
Final examination	32%	TBD

* Assessment marks for individual assessed tasks will be released within two weeks of the due date.

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Homework	[ILO1, ILO2, ILO3. ILO4. ILO5]	Assignments are given to students to facilitate learning in the subject (for outcomes 1, 2, 3, 4, 5)
Mid-Term, Final examination	[ILO1, ILO2, ILO3. ILO4. ILO5]	A mid-term exam and a final exam is held to assess student understanding during the learning process

Grading Rubrics

Detailed rubrics for each assignment will be provided after dude dates. These rubrics clearly outline the criteria used for evaluation. Students can refer to these rubrics to understand how their work will be assessed.

Final Grade Descriptors:

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates a comprehensive grasp of subject matter, expertise in problem-solving, and significant creativity in thinking. Exhibits a high capacity for scholarship and collaboration, going beyond core requirements to achieve learning goals.
B	Good Performance	Shows good knowledge and understanding of the main subject matter, competence in problem-solving, and the ability to analyze and evaluate issues. Displays high motivation to learn and the ability to work effectively with others.
C	Satisfactory Performance	Possesses adequate knowledge of core subject matter, competence in dealing with familiar problems, and some capacity for analysis and critical thinking. Shows persistence and effort to achieve broadly defined learning goals.
D	Marginal Pass	Has threshold knowledge of core subject matter, potential to achieve key professional skills, and the ability to make basic judgments. Benefits from the course and has the potential to develop in the discipline.
F	Fail	Demonstrates insufficient understanding of the subject matter and lacks the necessary problem-solving skills. Shows limited ability to think critically or analytically and exhibits minimal effort towards achieving learning goals. Does not meet the threshold requirements for professional practice or development in the discipline.

Course AI Policy

You are allowed to use generative artificial intelligence (AI) to aid you in any manner. However, you must give proper credit for any use of generative AI.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include [specific details, e.g., strengths, areas for improvement]. Students who have further questions about the feedback including marks should consult the instructor within five working days after the feedback is received.

Resubmission Policy

No resubmission will be allowed.

Required Texts and Materials

Probability Concepts in Engineering, Emphasis on Applications to Civil and Environmental Engineering, 2nd Ed., by Ang and Tang, published by John Wiley & Sons, Inc.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity | HKUST – Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.

[Optional] Additional Resources

N/A.