The Hong Kong University of Science and Technology

UG Course Syllabus

[Course Title] Probability for Engineers

[Course Code] IEDA2520

[No. of Credits] 3 credits

[Any pre-/co-requisites] AL Pure Mathematics; AL Applied Mathematics; MATH 1013 and MATH 1014.

Exclusions: LIFS 3150, ISOM 2500, MATH 2411, MATH 2421.

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Course Description

This is a systematic introduction to basic probability theory for engineering, including sample space, calculus of probability, conditional probability, expectation, moments, discrete and continuous probability distributions, limiting theorems, and various applications.

Intended Learning Outcomes (ILOs)

The course will demonstrate how to apply probability theory to gain insight into real problems and situations. Carefully developed coverage of probability motivates probabilistic models of real phenomena. The objective is to gain an intuitive understanding of random phenomena, and be familiar with probability tools most often used by practicing engineers and scientists. Upon the completion of this course, you will be able to:

- Understand basic concepts of probability
- Analyze randomness by using probability theory
- Be familiar with a range of widely used special random variables
- Calculate the probability of random events and expectation in practice

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
Homework	20%	Be announced on Canvas
Mid-Term	30%	25/10/2025
Final examination	50%	Determined by school

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

Mapping of Course ILOs to Assessment Tasks

[add to/delete table as appropriate]

Assessed Task	Mapped ILOs	Explanation
Homework	[ILO1, ILO2, ILO3, ILO4]	[This task assesses students' ability to explain and apply the concepts of probability (ILO 1, ILO 2), evaluate their quantitative ability (ILO3, ILO4).]
Midterm	[ILO1, ILO2, ILO3, ILO4]	[This task assesses students' ability to explain and apply the concepts of probability (ILO 1, ILO 2), evaluate their quantitative ability (ILO3, ILO4). As an in-class exam, this task also tests students' learning quality and proficiency for the whole course.]
Final Exam	[ILO1, ILO2, ILO3, ILO4]	[This task assesses students' ability to explain and apply the concepts of probability (ILO 1, ILO 2), evaluate their quantitative ability (ILO3, ILO4). As an in-class exam, this task also tests students' learning quality and proficiency for the whole course.]

Grading Rubrics

[Detailed rubrics for each assignment will be provided. 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:

[As appropriate to the course and aligned with university standards]

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

AI is allowed in this course except during the exam.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include the grades of homework. Students who have further questions about the feedback including marks should consult the TA within five working days after the feedback is received.

Resubmission Policy

Homework is allowed to be resubmitted before the due date. Late submission will not be accepted.

Required Texts and Materials

Textbook (optional):

• A First Course in Probability. Sheldon M. Ross, Global Edition, Tenth Edition, Pearson.

Comprehensive and systematic class notes, homework, and homework solutions will be posted

on Canvas. The book is not required but recommended.

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.