

The Hong Kong University of Science and Technology

UG Course Syllabus

Course Title: Fluid Mechanics

Course Code: CIVL 2510

No. of Credits: 3 Credits

pre-/co-requisites: MATH 2011 OR CIVL 2110

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Course Description

An introduction to the mechanics of fluids, including fluid statics, kinematics and fundamental equations of fluid flow, laminar and turbulent flow, boundary layers and applications in the design of hydraulic structures.

Intended Learning Outcomes (ILOs)

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

ILO1: Describe the fundamental concepts of fluid mechanics

ILO2. Apply basic equations to determine pressure by static fluid

ILO3. Analyze fluid flows with fundamental laws including mass, momentum, and energy conservation

ILO4. Apply principles of dimensional analysis to conceptualize and simplify real problems

ILO5. Understand the broad application of fluid mechanics in civil and environmental engineering

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:

Lab report (10%) allows for assessment of students' experimental skills and willingness to participate in learning environment.

Homework assignments (20%) with related examples allow for reinforcement and assessment of students' mathematical knowledge and understanding of fundamental principles.

Mid-term (30%) and Final exams (40%) allow for assessment of students' ability to apply knowledge learnt in class to solve engineering problems.

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Lab report	ILO1, ILO3	Lab experiment enriches students' knowledge in the fundamental processes of mass, momentum, and energy conservation (ILO1, ILO3).
Homework assignments	ILO1, ILO2, ILO3, ILO4	Homework assesses students' ability to comprehend the theoretical knowledge discussed in the lecture (ILO1, ILO2, ILO3, ILO4).
Mid-term/Final Exam	ILO3, ILO4, ILO5	Exams are designed to assess students' foundational understanding of fluid mechanics and their application in civil and environmental engineering.

Final Grade Descriptors:

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates a comprehensive grasp of fluid mechanics, expertise in problem-solving, and significant creativity in thinking. Exhibits a high capacity for scholarship and collaboration.
B	Good Performance	Shows good knowledge and understanding of the fluid mechanics, its potential application, and its relationship with civil and environmental engineering. Demonstrates competence in problem-solving, and the ability to analyze and evaluate fluid-related issues. Displays high motivation to learn and the ability to work effectively with others.
C	Satisfactory Performance	Possesses adequate knowledge of fluid mechanics, its potential application, and its relationship with civil and environmental engineering. Demonstrates some capacity for analysis and critical thinking. Shows persistence and effort to achieve completion of homework and laboratory experiments.
D	Marginal Pass	Has threshold knowledge of fluid mechanics, its potential application, and its relationship with civil and environmental engineering. Has the ability to make basic judgments, but with marginal effectiveness.
F	Fail	Demonstrates insufficient understanding of fluid mechanics and lacks the necessary problem-solving skills. Shows limited ability to think analytically and exhibits minimal effort towards achieving learning goals.

Course AI Policy

The use of Generative AI in project is permitted with proper acknowledgement and will NOT be contributed to the students' work.

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.

Required Texts and Materials (optional)

DF Young, BR Munson, TH Okiishi, & WW Huebsch, Introduction to Fluid Mechanics, 5thEd, Wiley, 2012

DF Elger, BA LeBret, CT Crowe, & JA Roberson et al., Engineering Fluid Mechanics, 10thEd, Wiley, 2013

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.