The Hong Kong University of Science and Technology

Course Syllabus for PHYS 3032 Classical Mechanics [3 Credits]

Term: Spring 2025

Instructor: Adrian PO

Email: hcpo@ust.hk

Office Hours: Wed 6-7 pm

Prerequisites: (PHYS 1111 OR PHYS 1112 OR PHYS 1312) AND MATH 2023

Course Description

Newtonian mechanics, including rigid bodies; oscillating systems; gravitation and planetary motion; Lagrange equations; Hamilton's equations; normal modes and small oscillations.

Intended Learning Outcomes (ILOs)

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

1. Develop suitable mathematical models for to quantitatively describe physical phenomena

2. Solve for the motion of objects for some standard families of idealized mechanical systems

3. Acquire problem-solving techniques for attacking complex problems

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/ exam date(s)
Problem sets (best 8)	20%	Fridays by 12 noon in general
Mid-term exam	30%	19/03/2025
Final exam	50%	TBD
Tutorial pop quizzes x5	up to 5% as bonus	Tutorial sessions through the semester

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Problem sets	ILO1, ILO2, ILO3	Students make their way towards the three ILOs while solving the problems in the problem sets.
Mid-term exam	ILO1, ILO2, ILO3	The mid-term exam assesses students' mastery of the ILOs.
Final exam	ILO1, ILO2, ILO3	The final exam assesses students' mastery of the ILOs.
Tutorial pop quizzes	ILO1, ILO2, ILO3	The tutorial pop quizzes provide feedback on the students' mastery of the ILOs throughout the semester.

Grading Rubrics

Points		Description
Short Q	Long Q	
---	+1	***Possible bonus for exceptional performance***, e.g., perfect solution presented in a logically coherent manner, signs of deep physics insight, creative approach to the problem, demonstration of good problem-solving skills
3	7-9	***Practically correct*** with only small careless mistakes that do not originate from conceptual misunderstanding, e.g., didn't carry over an overall factor of 2, correcting a sign error in the final answer by arguing what the sign should have been based on physical intuition
2	4-6	***Showing clear understanding*** on the physics and/ or how to approach the problem but committed substantial mistakes, e.g., wrong overall sign opposing physical intuition, got all the physics right but screwed up badly on the math
1	1-3	***Reasonable attempt but not quite correct***, e.g., writing down some relevant equations without showing how they can be used to solve the problems, didn't proceed beyond the very first steps of solving the problem
0	0	***No sign of understanding*** (including no attempt)

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.
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.
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 acquire the expected skills for performing well in the course.
D	Marginal Pass	Has threshold knowledge of core subject matter. Demonstrates motivations to acquire the expected skills required for completing the course.
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.

Course AI Policy

You are always encouraged to make creative use of emerging technologies, including generative AI, to assist your learning. At the same time, you are reminded to abide to the academic code of honor for any work you submit for assessment purposes.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas normally within two weeks of submission. Students who have further questions about the feedback including marks should consult the instructor within five working days after the marks are released.

Resubmission and Late Submission Policy for Assignments

Assignments can be resubmitted as many times as desired before the deadline. Resubmission after the deadline will be graded as late submission.

Assignment submitted within one week from the original deadline will be graded with a 50% discount on the score. Submissions after this one-week grace period will not be graded.

Required Texts and Materials

No official required texts. See Canvas for lecture notes and suggestions on extra reference books.

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.