The Hong Kong University of Science and Technology

UG Course Syllabus

[Course Title] Control Principles

[Course Code] MECH3610

[No. of Credits] 3

[Any pre-/co-requisites] N/A

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Course Description

This course introduces the essential concepts every control engineer should know. It explains the motivation for studying control principles and identifies the types of systems we focus on at the beginning, particularly Linear Time-Invariant (LTI) systems. Students will learn the fundamental tools needed to analyze systems from multiple perspectives, and apply these tools to design controllers that ensure stability, safety, and desired performance by minimizing error signals.

Instruction will be delivered through lectures and in-class discussions. In addition, there will be 12 tutorials, each operated by one of three teaching assistants, corresponding to 12 assignments. The assignments will be primarily based on MATLAB, providing hands-on experience with this powerful computational tool for analyzing control problems. The final exam will be based on these 12 assignments.

As an entry-level course, the content will be kept intuitive, with an emphasis on conceptual understanding. The goal is to help students recognize the importance of control principles, develop practical problem-solving skills, and prepare them for applying these concepts in future studies.

Assessments:

[List specific assessed tasks, exams, quizzes, their weightage]

Assessment Task	Contribution to Overall Course grade (%)
Mid-Term	24%
In-course essay	N/A
Group Project	N/A
Final examination	76%

Required Texts and Materials

In general, the class slides will be sufficient. Additional materials and links will be provided during the course. However, you may also refer to the following textbook.

TEXTBOOK:

Modern Control Systems - Richard C. Dorf and Robert H. Bishop - 13th Edition, Pearson (previously

Prentice Hall) [ISBN: ISBN-13: 9780132270281]