

The Hong Kong University of Science and Technology

UG Course Syllabus Template

[Course Title] **Foundations of Mechanical and Aerospace Engineering**

[Course Code] **MECH 1910**

[No. of Credits] **3 Credits**

[Any pre-/co-requisites] **NO**

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Course Description

This course serves as an introduction to Mechanical and Aerospace engineering, covering theoretical concepts and basic core principles across four key sub-areas: (1) aerospace engineering; (2) mechanics and materials; (3) design and manufacturing; (4) thermo-fluids. It provides a solid foundation for students to develop essential analytical and problem-solving skills, enabling them to approach future major courses with confidence. The curriculum includes topical studies organized into these four main modules. Fundamental concepts and principles are demonstrated and visualized through real-life examples. On successful completion of the course, students will be able to:

1. Understand the theoretical concepts in mechanical and aerospace engineering;
2. Be familiar with the basic core principles in mechanical and aerospace engineering and able to explain how they are applied to meet societal needs;
3. Apply the analytical thinking and problem – solving skills;
4. Function with engineering mindset and teamwork spirits in addressing real – world challenges;
5. Recognize the impact of aerospace and mechanical engineering as a profession.

Course Topics: 1. Introduction and Engineering Ethics;

<i>Module I – Aerospace Engineering</i> 2. Aircraft design overview 3. Aircraft configuration 4. Aerodynamics (1) 5. Aerodynamics (2) 6. Propulsion systems (1) 7. Propulsion systems (2)	<i>Module II – Materials and Mechanics</i> 8. Statics and Dynamics 9. Solid Mechanics 10. Engineering Materials 11. Metals 12. Polymers
<i>Module III – Design and Manufacturing</i> 13. Controls 14. Robots and Automation 15. Engineering Design 16. Manufacturing 17. Mechanism of Machinery	<i>Module IV – Thermo-Fluids</i> 18. Thermodynamics 19. Heat and Heat Transfer 20. Fluid Mechanics (1) 21. Fluid Mechanics (2) 22. Energy and Energy Utilization

Assessments:

Assessment Task	Contribution to Overall Course grade (%)
Four Assignments	20%
In-class quiz 1 (Module 1)	10%
In-class quiz 2 (Module 2)	10%
In-class quiz 3 (Module 3)	10%
In-class quiz 4 (Module 4)	10%
Final Exam	40%

More information about this course:**Required Texts and Materials**

There is NO required textbook. This course is based on lecture notes which are prepared from a wide range of references.