

The Hong Kong University of Science and Technology

Practical Engineering Projects with Mechanics of Materials

MECH4000Q

3 Credits

Pre-/co-requisites] : MECH 2040 “Solid Mechanics I” or CIVL 2120 “Mechanics of Materials”

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Course Description

Mechanics of materials plays a vital role in engineering design to ensure the structural integrity and performances of various machine elements and structures during services. This course is designed to enhance students’ further understanding of mechanics of materials and prepare them for the readiness in a related career by offering the following:

- **Advanced topics:** Delve into the subjects such as stress analysis and failure criteria, plastic deformation in torsion and bending, un-symmetric bending and eccentric loading, beams on elastic foundation, fatigue analysis, shearing stresses in thin -walled members and shear center, etc.
- **Hands – on learning:** Apply the above theoretical concepts to four practical engineering projects, including load and stress analysis of human body in exercise; safety analysis of airplane components; wind turbine shaft analysis; and railway track deflection analysis.
- **Skill development:** Further develop your analytical skills and learn to communicate effectively through report writing and presentations.

The objectives of this course are helping students to:

- Develop problem - solving skills crucial to real engineering challenges;
- Enhance their employability in the related industries;
- Gain a competitive edge in both job hunting and further study arrangement.

Assessments:

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

Assessment Task	Contribution to Overall Course grade (%)
Quizzes 1 and 2	20%
Project 1	20%
Project 2	20%
Project 3	20%
Project 4	20%

Required Texts and Materials

[List required textbooks, readings, and any other materials]

Mechanics of Materials, 7th Edition, by Beer, Johnson, DeWolf and Mazurek, McGraw Hill.

Advanced Mechanics of Materials by Arthur P. Boresi and Richard J. Schmidt

[Optional] Additional Resources

[List any additional resources, such as online platforms, library resources, etc.]