

The Hong Kong University of Science and Technology

[Course Title] **Engineering Materials I**

[Course Code] **MECH 2410**

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

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

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Course Description

MECH2410 is an introductory course on materials science and engineering with a focus on metallic materials. It offers a general introduction about the basic concepts of materials science and engineering including atomic structures and bonding, crystallography and crystal structures, mechanical behaviors, defects in solids, strengthening mechanism, diffusion and phase transformation, as well as various material processing technologies and business opportunities based on materials innovations.

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

- (i) Analyze and explain key physical and mechanical behaviors of the classical engineering materials;
- (ii) Explain the underlying mechanism for the specific physical/mechanical property of the material based on the understanding of atomic structure, bonding and crystallography.
- (iii) Explain the relationship between the processing parameters and the associated mechanical properties and phenomena such as modulus, ductility and strengthening of the material
- (iv) To identify the proper materials with the physical/mechanical properties serving the suitable engineering applications.

Assessments:

Assessment Task	Contribution to Overall Course grade (%)
Assignments	20%
In-class quizzes	10%
Laboratory reports	10%
Mid – term exam	20%
Final exam	40%

Required Texts and Materials

MATERIALS SCIENCE AND ENGINEERING: An Introduction; 10th Edition, William D. Callister, Jr. (Selected chapters)

[Optional] Additional Resources

1. Askeland, D.R. & Wright, W.J. (2006). *The Science and Engineering of Materials* (5th ed.). Stamford, CT.: CENGAGE Learning
2. Smith, W. F., & Hashemi, J. (2010). *Foundations of materials science and engineering* (5th ed.). Boston, Mass. [u.a.: McGraw-Hill Higher Education.
3. Shackelford, J. F. (2005). *Introduction to materials science for engineers* (6th ed.). Upper Saddle River, N.J: Pearson/Prentice Hall.

More information about this course:

Laboratory Sessions:

There are three REQUIRED practical experiments in this course: Tensile Testing, Hardness Testing and Impact Testing, demonstrated in two CONCURRENT laboratory sessions which are group based. Group lab reports are due on CANVAS within **1-week** after the lab session. Lab reports will not be accepted if you did not attend the lab session.

Plagiarism and Academic Dishonesty:

Any form of plagiarism or academic dishonesty will not be tolerated in this course. Any plagiarized (in part or in full) homework assignment(s) and/or lab report(s) will receive a zero on the first incidence. Any further incidences will be reported to the department according to the HKUST Policy on Academic Integrity (<https://registry.hkust.edu.hk/resource-library/regulations-student-academic-integrity>)