

科目ナンバリング		U-LAS12 10031 LE57									
授業科目名 <英訳>		Fundamentals of Materials I-E2 Fundamentals of Materials I-E2				担当者所属 職名・氏名		工学研究科 准教授 GAO, Si			
群	自然科学科目群			分野(分類)		物理学(基礎)			使用言語		英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義 (対面授業科目)				
開講年度・ 開講期	2025・前期		曜時限	木2		配当学年	主として1・2年生		対象学生	理系向	
[授業の概要・目的]											
This is the first half of a two-semester course Fundamentals of Materials. The purpose of this course is to give a concise but comprehensive introduction covering all major classes of materials to the students majored in physical engineering. The characteristics of all main classes of materials - metals, polymers and ceramics, as well as their physical properties, are explained with reference to real-world examples. In the first semester we will firstly introduce the elements and atomic structure, and then mainly focus on the structure and mechanical properties of metallic materials.											
[到達目標]											
Students are expected to have a broad understanding of fundamental aspects of metallic materials, such as atomic microstructure, microstructures and mechanical properties of metallic materials by taking this course.											
[授業計画と内容]											
Week 1. Introduction to materials and materials science Week 2. Atomic structure and interatomic bonding Week 3. Structure of crystalline solids Week 4-5. Imperfections in solids Week 5. Diffusion Week 6-7. Mechanical properties of metals Week 8. Strengthening mechanisms in crystalline materials Week 9. Failure of materials Week 10. Phase diagrams Week 11. Phase transformations Week 12-13. Engineering alloys Week 14. Characterization techniques of the materials A total of 14 lectures and one feedback class will be given.											
[履修要件]											
特になし											
[成績評価の方法・観点]											
Attendance and class participation [50%] Homework assignments [50%]											
[教科書]											
使用しない											
[参考書等]											
(参考書) William D. Callister, David G. Rethwisch, 『Materials Science and Engineering: An Introduction』 (John Wiley & Sons Inc) ISBN:1118319222											
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[授業外学修（予習・復習）等]

Assignment (Quiz) are set for the review after class. The necessary time for assignments is around 1.5 hours for each class.

[その他（オフィスアワー等）]

[主要授業科目（学部・学科名）]