

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	2024・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											
Fundamentals of Materials I-E2(2)へ続く											

## Fundamentals of Materials I-E2(2)

### [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）]