

2. 機械・システム工学系 Mechanical and System Engineering Field			MSE-F2
授業科目名 Course Title	材料力学及び強度 Strength of Materials	単位数 Credit	2
担当教員 Instructor	旭吉 雅健 HIYOSHI Noritake 雷 霄雯 LEI Xiao-Wen	開講学期 Semester	秋学期 Fall
キーワード Keywords	Molecular simulation, Creep-Fatigue		

授業概要 Course summary	
<p>1) 原子シミュレーションの基礎理論 Fundamental Theory of Atomistic Simulations 分子動力学を用いる原子シミュレーションについて講義する。 Atomistic simulations based on molecular dynamics are lectured.</p> <p>2) 金属疲労と高温強度の基礎 Fatigue and High Temperature Strength 疲労や高温強度に関する評価手法の基礎を解説する。 The fundamentals of cyclic fatigue and high temperature strength are provided.</p>	
到達目標 Course goal	
<p>This class introduces engineering students to the fundamental theory of stress and strain of structural components. The goals of this class include:</p> <ol style="list-style-type: none"> 1. Understand the fundamental theory of molecular dynamics 2. Understand the fundamentals of cyclic fatigue and high temperature strength. 	
授業内容 Course description	
<p>(1. Atomistic simulation)</p> <ol style="list-style-type: none"> 1.1 Atomistic modeling and simulations 1.2 Theory of molecular dynamics (1) 1.3 Theory of molecular dynamics (2) 1.4 Example of atomistic simulation 1.5 Simulation program 1.6 Practice of atomistic simulation 1.7 Visualization of atomistic simulation <p>(2. Fatigue and High Temperature Strength)</p> <ol style="list-style-type: none"> 2.1 What's is "Fatigue"? 2.2 High Cycle Fatigue 2.3 Low Cycle Fatigue 2.4 What is problem at elevated temperatures? 2.5 Creep and Creep-fatigue evaluation 2.6 Practice1 -tensile test- 2.7 Practice2 -tensile properties evaluation- 	
準備学習（予習・復習）等 Preparation / Review	
Review the learned lesson	
授業形式 Class style	
講義（演習を含む） Lectures with practice	
成績評価の方法・基準 Method of evaluation	

レポート Reports
教科書・参考書等 Textbook and material
Printed materials prepared by instructors
受講要件・予備知識 Prerequisite
その他の注意事項 Note
Notebook computer is needed for 1.4~1.7.