Course Numbering	TMA-MEE208E
Year	Second semester 2025
Subject (J)	Mechanics of Materials I
Subject	(IMAC-U)Mechanics of Materials I
Credit(s)	2Credits
Instructor	TOMONAGA OKABE,YUJI ICHIKAWA
Media Class Subjects	
Essential Subjects	○
Language of Instruction	
Course Objectives and Summary/ Learning Goals (J)	Google Classroom class code: vemxeyz (https://www.eng.tohoku.ac.jp/edu/syllabus-ug.html)
Course Objectives and Summary/ Learning Goals	The class code of this course in Google Classroom system is "vemxeyz" in the academic year of 2024 . 1. Class subject Mechanics of materials is a branch of applied mechanics that deals with the basic behavior of solid bodies subjected to various types of loading. The knowledge of the stress and strain set up within the bodies and resulting deflection is a prerequisite for the structural design of industrial products and infrastructures such as buildings, roads, bridges, and various equipments. In this course, the basic idea of the structural design is provide based on the quantitative evaluation of mechanical stress and strain fields in various structures. 2. Object and summary of class This course is intended as an introductory course in the mechanics of solids offered to engineering students. It concentrates on developing analysis techniques from principle for a range of practical problems that include simple structures, pressure vessels, beams and shafts. 3. Goal of study The goal of this course is the acquisition of the basic concept of stress and strain in material s and structures and the quantitative analytical method of stress and strain fields in various structures.
Relevance to Other Subjects/Considerations for Taking the Class (J)	
Relevance to Other Subjects/Considerations for Taking the Class	It is assumed that the students have had some experience in elementary statics (mechanics of rigid bodies) and mathematics (such as differentiation and integration).
Course Description (J)	
Course Description	1. Introduction: Highly functional and reliable design of structures 2. Basic concept of stress and strain 3. Mechanical properties of materials 4. Hook's law and strength of materials 5. Two-dimensional stress and strain fields (Pin-jointed structure) 6. Thermal stress and residual stress 7. Thin rings and stress concentration 8. Mid-term exam. 1 9. Biaxial stress and strain fields: Normal stress, shear stress 10. Combined tress field: Principal stress and Mohr's circle 11. Combined tress field: Two-dimensional Hooke's law 12. Torsion: Circular shafts 13. Torsion: Stepped bar, Power transmission 14. Torsion: Thin-walled tube, Rectangular shaft 15. Mid-term exam. 2 16. Final exam
Preparation and Review(J)	---
Preparation and Review	Homework is assigned at every lecture.
Evaluation methods and criteria (J)	
Evaluation methods and criteria	1. Homework (every lecture): 10% 2. Mid-term exams. 1 and 2 (Two-pages of notes are permitted.): 40% (20% each) 3. Final exam.(Closed book and no notes): 50%

Textbooks and references					
Title	Author	Publisher	Year	ISBN/ISSN	Classification

URL	
Attached File	
Office Hours(J)	
Office Hours	
Contact： Please insert '@' in the email address.	クラスルームで連絡可能
Notes	1) M. C. Potter, "Strength of Materials, Seventh Ed.", Schaum's Outline Series, McGraw-Hill, (2020). 2) S. Timoshenko and D. H. Young, "Elements of Strength of Materials," Van Nostrand Reinhold Company, (1968). 3) Crandall, S. H., T. J. Lardner, and N. C. Dahl, "An Introduction to the Mechanics of Solids. 2nd ed.", McGraw-Hill, (1999).
Practical Skill/Hands-on Class	主として実践的教育から構成される実務・実践的授業／Practical business
Other Comments/Instructions	
Last Update	2024/02/07 15:56:01

One-credit courses require 45 hours of study. In lecture and exercise-based classes, one credit consists of 15-30 hours of class time and 30-15 hours of preparation and review outside of class. In laboratory, practical skill classes, one credit consists of 30-45 hours of class time and 15-0 hours of preparation and review outside of class.