

# COURSE DETAIL

## MECHANICS OF MATERIALS

**Country**

Japan

**Host Institution**

Tohoku University

**Program(s)**

Engineering and Science

**UCEAP Course Level**

Upper Division

**UCEAP Subject Area(s)**

Engineering Civil Engineering

**UCEAP Course Number**

100

**UCEAP Course Suffix**

BW

**UCEAP Official Title**

MECHANICS OF MATERIALS

**UCEAP Transcript Title**

MECHNCS OF MATERIAL

**UCEAP Quarter Units**

3.00

**UCEAP Semester Units**

2.00

### **Course Description**

Mechanics of Materials utilizes models that drastically simplify the geometry of structures/components to be designed and the loading modes acting on them, while retaining their essential feature. Based on the simplified models the fundamental and necessary knowledge of their mechanical responses is derived and therefore provides the design of the structures/components.

This course is intended as an introduction to mechanics of solids to engineering students. It presents the underlying theories and formulations for the description of stress/strain and deformations under various types of loading.

Mechanics of Materials II discusses the loading mode of bending in addition to tension/compression and torsion treated in Mechanics of Materials I.

Beams subjected to bending moments are extensively analyzed. This course covers topics such as (1) Theory of beams, which allows us to calculate bending/shear stresses in beams and their deflections; (2) Energy methods such as Castigliano's theorem, and (3) Compression-induced failure such as buckling.

By the end of the course, students should be able to calculate the stresses and deformation and determine the condition of buckling in simple structures/components such as beams and frames.

### **Language(s) of Instruction**

English

### **Host Institution Course Number**

N/A

### **Host Institution Course Title**

MECHANICS OF MATERIALS II

### **Host Institution Course Details**

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**Host Institution Campus**

Tohoku University

**Host Institution Faculty**

**Host Institution Degree**

**Host Institution Department**

JYPE

**Course Last Reviewed**

2023-2024

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