

Advanced Mechanics of Materials

1. Title

Advanced Mechanics of Materials

2 Lecturer, Units

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3 Purpose

For a good prediction of structural behavior, the modeling of material behavior (stress-strain relationship) is very important. To this end, plasticity-based modeling of material behavior is studied in this course, One-dimensional modeling is first discussed, which is followed by the modeling of material behavior in multi-dimension. Specifically, the Mises type of material is picked out to illustrate the plasticity-based model. It is noted that this type of model is exclusively used in the analysis of steel structures.

4 Lecture schedule

1. One-Dimensional Material Behavior and Simple Modeling
2. Plasticity-Based Modeling of One-Dimensional Material Behavior
3. Example Problem
4. Essentials of Stress
5. Essentials of Stress
6. Essentials of Strain
7. Essentials of Stress-Strain Relationship
8. Plasticity Theory in Multi-Dimension
9. Plasticity Theory in Multi-Dimension
10. Plasticity Theory in Multi-Dimension
11. Stress-Strain Relationship
12. Example Problem
13. Example Problem
14. Numerical Procedure
15. Example Problem

5 Evaluation

Homework assignments and examinations

6 Note

This lecture is provided in English.

7 Textbook Reference

Reference book:

Plasticity for Structural Engineers

Wai-Fah Chen and Da-Jian Han

J. Ross Publishing