

Structural Performance Control, 2019

Prof. Masaki Maeda

■ Contents of lecture

Fundamental theories are introduced for sustainable building structure with effective use of natural resources and reduction of environmental burden. Described in the lecture are basic concept and method for

- seismic evaluation and retrofit of existing buildings
- seismic performance evaluation and performance-based design of new buildings
- risk assessment against seismic force etc.

■ Plan for lectures

- (1) Schedule for lectures are as follows.
- (2) Home works are given on every lectures.
- (3) Report of the home works should be submitted at the beginning of the next lecture.
- (4) Manuscripts for lectures are available at web site of Maeda Lab.

<https://www.maedalab-tohoku-u.com/class>

■ Schedule

13:00 – 14:30, Monday

No.	Date	Contents
1	Apr. 8	Guidance, History of seismic damage and structural design of buildings
2	Apr. 15	Current seismic standard (Allowable stress design and ultimate strength design)
3	Apr. 22	Seismic evaluation of existing buildings, part 1 first level procedure
4	May 13	Seismic evaluation of existing buildings, part 2 second level procedure
5	May 20	Basic of probability theory
6	May 27	New design of earthquake resistant RC buildings based on inelastic displacement concept
7	Jun. 3	Cancel business trip to Tokyo)
8	Jun. 10	Exam 1
9	Jun. 17	Seismic performance evaluation of RC buildings, part 1
10	Jun. 24	Cancel (business trip to Greece)
11	Jul. 1	Seismic performance evaluation of RC buildings, part 2
12	Jul. 8	Prediction of seismic risk and damage to buildings
13	Jul. 22	Seismic risk management for buildings
14	Jul. 29	Exam. 2
15	Aug. 3	Reserved

■ Evaluation

Grade is evaluated by the results of examination 1 and 2. Home works and attendance are not considered in the final grades.

■ References

- (1) AIJ, “Design Guidelines for Earthquake Resistant Reinforced Concrete Buildings based on Inelastic Displacement Concept”, Maruzen (in Japanese)
- (2) AIJ, “Guidelines for Performance Evaluation of Earthquake Resistant Reinforced Concrete Buildings”, Maruzen (in Japanese)
- (3) AIJ, “Recommendations for Limit State Design of Buildings”, Maruzen (in Japanese)
- (4) Akenori Shibata, “Analysis of Structural Safety by probabilistic approach”, Morikita Publishing Co., Ltd. (in Japanese)
- (5) Masaru Hoshiya and Takaaki Nakamura, “Seismic Risk Management of Structures”, Sankaido Co., Ltd. (in Japanese)
- (6) JBDPA, “Standard for Seismic Evaluation of Existing reinforced Concrete Buildings, 2001 revised edition” (in Japanese)