Lecture Syllabus

Spring, 2018

Earthquake Engineering

Lecturer : Hong-Gun Park (880-7055, Building 39-431 parkhg@snu.ac.kr)

Lecture time : Mon & Wed 12:30 – 13:45

Lecture Summary : Basic concept of Earthquake Design of Buildings. Earthquake design of members and details.

Lecture notes : notes will be distributed through TA, before each class.

References:

1. 건축구조기준 2016 (Korean Building Code)
2. Naeim, F, The Seismic Design Handbook, 2nd Ed., KAP
3. ACI 318-11 (concrete design code)
4. AISC-LRFD (steel design code)
5. ATC 40, 440 (Applied Technology Council)
6. NEHRP 273, 274 (National Hazards Reduction Program)

Contents:

1. 서론 (Introduction)

   Causes, effects, history of Earthquakes
2. 지진공학(Engineering Seismology)

   ground waves, types of waves, magnitude and intensity
3. 설계지진강도 (Selection of Design Earthquakes)

   Methods for selecting design earthquake, design response spectrum
4. 건축물의 동적응답 (Review and Computation of Dynamic Response)

   Basics of dynamics, calculation of building responses under earthquakes
5. 내진설계의 개념 (Basic Principles of Earthquake-Resistance Design)

   Limit states, calculation of design load, analysis, design procedure
6. 내진설계법 (Design method : design concept, design load, analysis method)
   - Korean Building Code (KBC), Building Law
   - 콘크리트구조기준 (Koran Concrete Institute code)
   - International Building Code (IBC)
   - ACI 318-11 for concrete
   - AISC-LRFD for steel design
7. 비선형 해석과 성능기반설계 (nonlinear analysis and performance-based design)

   - Nonlinear Static analysis, Nonlinear time history analysis.

Prerequisites : structural analysis, structural dynamics, reinforced concrete design/ steel design

Evaluation : Homework : 10 %

1st project : 30 % Calculation of earthquake load, Design of structural system

2nd project : 30% Design of members and details

3rd project : 30% Structural Evaluation using nonlinear analysis

Homework Earthquake Engineering, spring 2018.

Investigate the instances of damages in the events of previous earthquakes (including 2016 Kyungju EQ and 2017 Pohang EQ, and discuss the lessons that we can learn from the damages.

Make a ppt file showing the pictures and information relevant to the earthquake damages and lessons.

Submit the ppt file until March 21.