EPFL

CIVIL-714 | **Performance-based earthquake engineering**

Lignos Dimitrios

Cursus	Sem.	Type
Civil & Environmental Engineering		Opt.

Language of teaching	English
Credits	3
Session	
Exam	Project report
Workload	90h
Hours	**60**
Courses	40
TP	20
Number of positions	**20**

Frequency

Every 2 years

Remark

Next time: Fall 2021

Summary

Quantitative decision making based on life-cycle considerations that incorporate direct losses, seismic risk assessment, and collapse. Seismic hazard analysis, response simulation, damage and loss estimation, collapse prediction. Case studies.

Content

Advanced topics in probabilistic seismic hazard analysis, structural behavior and simulation with emphasis on nonlinear modeling including collapse prediction, nonlinear modeling criteria, damage estimation, seismic risk assessment, vulnerability curves, earthquake-induced loss estimation and life-cycle analysis.

Keywords

Performance-based earthquake engineering
seismic risk assessment, life-cycle assessment, loss estimation

Learning Prerequisites

Required courses

seismic engineering, structural dynamics

Recommended courses

nonlinear analysis, structural design and behaviour of structures

Learning Outcomes

By the end of the course, the student must be able to:

• Conduct probabilistic seismic hazard analysis Conduct a seismic performance assessment of structures Conduct life-cycle assessment considering earthquake-induced losses

Resources

Bibliography

Bozorgnia, Y., Bertero, V.V. (2004). Earthquake Engineering: From Engineering Seismology to Performance-Based Earthquake Engineering, CRC Press

Ressources en bibliothèque

- Bozorgnia, Y., Bertero, V.V. (2004). Earthquake Engineering: From Engineering Seismology to Performance-Based Earthquake Engineering, CRC Press