ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE

Prof. Dr Dimitrios Lignos (DL), Dr. Savvas Saloustros (SS)

Course: Nonlinear analysis of structures (CIVIL-449)
Autumn semester 2024

Week		Person	Course	Assignments
1	09/09/24 11/09/24	DL	Motivation; course organization and evaluation. Linear versus nonlinear systems / static versus dynamic loading	
2	16/09/24 18/09/24	DL	Revision on matrix structural analysis / static and dynamic equilibrium equations	Assignment #1
3	23/09/24 25/09/24	DL	Truss and frame elements	
4	30/09/24 02/10/24	DL	Linear and nonlinear geometric transformations	
5	07/10/24 09/10/24	DL	Material response and uniaxial constitutive formulations	Submission of Assignment #1 / Assignment #2
6	14/10/24 16/10/24	DL	Solution methods in nonlinear analysis	
7	21/10/24 23/10/24	Study break		
8	28/10/24 30/10/24	DL	Concentrated plasticity	
9	04/11/24 06/11/24	DL	Displacement-based beam-column elements	Submission of Assignment #2 / Assignment #3
10	11/11/24 13/11/24	DL	Integration methods	
11	18/11/24 20/11/24	DL	Flexibility-based beam-column elements / Multipoint constraints	
12	25/11/24 27/11/24	SS	Constitutive models based on plasticity	Submission of Assignment #3 / Assignment #4
13	02/12/24 04/12/24	SS	Constitutive models based on continuum damage mechanics	
14	09/12/24 11/12/24	SS	Smeared crack models / mesh dependency / Application examples of constitutive models for structural analysis	
15	16/12/24 18/12/24	DL/SS	Examples of nonlinear analysis of buildings – Discussion of choice of modelling approaches and their effect on the results	Submission of Assignment #4

Lausanne, 09/09/2024

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Office hours:

- Hnat Lesiv (teaching assistant): on appointment (GC B2 484, hnat.lesiv@epfl.ch)
- Dr. Diego Heredia Rosa (teaching assistant): on appointment (GC B3 464, diego.herediarosa@epfl.ch)
- Prof. Dimitrios Lignos: on appointment (GC B3 485, dimitrios.lignos@epfl.ch)
- Dr. Savvas Saloustros: on appointment (GC B2 514, savvas.saloustros@epfl.ch)

Homework assignments and project:

- Homework assignments can be solved in groups of two.
- Grade: the final grade is computed as follows:
  - o Exam: 60%
  - o Assignments: 40%

Exam:

- Exam: 3 h written exam.
- Closed book exam.
- Permitted: 2-page summary (1 sheet recto-verso); handwritten
- Calculator

Lausanne, 09/09/2024