

Nonlinear Mechanics

BMEEOTMMN-2

2021-2022/1 Semester, MSc

	Fr. 11-13	Lecture	Fr. 13-14	Exercise
1.	10. Sep.	Basic variables, equations of motions, gradient tensor.	10. Sep.	Mathematical fundamentals, index notations, calculation of the derivatives.
2.	17. Sep.	Strain tensors. Principal strains.	17. Sep.	Deformation gradient tensor.
3.	24. Sep.	Stress tensors.	24. Sep.	Application of strain tensors.
4.	01. Oct.	Material model, modeling of elastic behavior.	01. Oct.	Stress tensors.
5.	08. Oct.	Plastic- and time-dependent material behavior.	08. Oct.	Analysis of a nonlinear bar under pure tension.
6.	15. Oct.	The basic equations of mechanics, strong- and weak forms.	15. Oct.	Material models.
7.	22. Oct.	Work theorems, interchangeability theorems.	22. Oct.	1. TEST. Basic variables, material models (60 minutes).
8.	29. Oct.	Energy theorems.	29. Oct.	Work and energy theorems.
9.	05. Nov.	Connection between the boundary value- and variational problems. Basic solution methods of mechanics.	05. Nov.	Energy theorems.
10.	12. Nov.	Stress functions.	12. Nov.	Stress functions. Analysis of shear- and torsion effects of specific beams.
11.	19. Nov.	Basic equations of beams.	19. Nov.	Analysis of shear- and torsion effects of specific beams.
12.	26. Nov.	-----	26. Nov.	-----
13.	03. Dec.	Calculations of curvatures of shell structures. Different mechanical models of plates.	03. Dec.	Determination of curvature tensors.
14.	10. Dec.	Basic equations of the shells.	10. Dec.	2. TEST. Work- and energy theorems (60 minutes). Homework.

Budapest, 26-07-21.

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