Final exam questions

Subject group name: **Beam Structures**

Neptun code: ZVEGEMMNWBS

Credit points: 3

Subject in this subject group:

Beam Structures (BMEGEMMNWBS)

Program: Mechanical Engineering Modelling, MSc (2N-MW0)

Specialization: Solid Mechanics

Responsible person: Dr. András Szekrényes, szeki@mm.bme.hu
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Faculty of Mechanical Engineering

You can check the current subject forms at the Educational Portal of the Faculty of Mechanical Engineering.

https://oktatas.gpk.bme.hu/

Always check the for updates at edu.gpk.bme.hu before preparing for the exam, especially if the subject group contains at least one subject from your final semester!

Valid from 01 September 2021

Dr. András Szekrényes
associate professor

Beam Structures (BMEGEMMNWBS)

1. Axial warping of an open rectangular section. Distribution of sector area function, coordinates, torsional center calculation, 3D plot of warping.

2. Constrained torsion of thin-walled open sections. Normal stress from constrained torsion. Definition of the bimoment, explanation based on an I-section beam.

3. The governing DE of constrained torsion, the possible kinematic and dynamic boundary conditions. Effect of free and built-in cross sections.

4. Flexural shear stresses in a U-section member. Statical moment, shear flow and stress distribution. Calculation of the shear center by moment equilibrium.

5. Nonlinear bending of a cantilever beam subjected to concentrated moment and concentrated force, basic solution steps, initial parameters. Load-displacement curve and bending moment diagram.