

**Course:** Structural stability

**Lectures:** The concept of loss of stability. Basic stability criteria. The static method, energy method and dynamic method for determining the critical load. Critical points: static bifurcation point, unstable bifurcation point, boundary point. The influence of load and geometry imperfections on stability. Flexural stability, torsional stability, flexural-torsional stability of bar elements. Lateral torsional buckling of bent elements. Stability of compressed slabs and stability of sheared slabs. Shell stability. Initial stability and nonlinear stability. Taking into account geometric non-linearity and physical non-linearity. Non-conservative problems. Stability and the theory of the second order. Structural stability in terms of standard regulations: metal structures, wooden structures, reinforced concrete structures. Application of commercial software to determine critical loads.

**Project:** An analytical solution to the stability problem of a discrete system with one degree of freedom. Application of the Timoshenko energy criterion for determining the critical load of compressed bars (analytical solution with the use of MathCAD). Application of the Timoshenko energy criterion for determining the critical stress of compression slabs. Verification of the solution using commercial software (Robot, Cosmos / M).

**Responsible person:** Jakub Marcinowski, Prof. DSc, PhD, Eng.

**More info:** <https://webapps.uz.zgora.pl/syl/index.php?/course/showCourseDetails/1224500>