

## **Faculty of Architecture**

**Department:** Construction Engineering

**Professional field:** 5.7. Architecture, Civil Engineering and Geodesy

**Specialty:** Building Constructions

**Educational-qualification degree:** Master

### **COURSE DESCRIPTION**

1. Course title: **Dynamics and Stability of Building Structures**
2. Course code: **CIE 3002**
3. Type of course: **compulsory**
4. Level of course: **Master**
5. Year of study: **first**
6. Semester when the course is delivered: **second**
7. Number of ECTS credits allocated: **6 (3 – lectures and 3 – seminars and coursework)**
8. Name of lecturer: **Assoc. Prof., Eng. Ivan Pavlov, PhD**
9. Learning outcomes of the course: as a result of the course students will know about the features in the design with the programs SAP 2000 and Tower 6 in determining the critical loads, decisions on the theory of II order and calculation of structures for seismic loads, will be able to extend and complement the knowledge acquired in the Bachelor degree, will be able to apply their knowledge in contemporary design of stability and dynamic tests carried out with these computer programs.
10. Mode of delivery: **face-to-face**
11. Prerequisites and co-requisites: students have to possess the necessary theoretical and practical knowledge in Stability and Dynamics of Building Structures from the Bachelor's course of Construction Engineering.
12. Course contents: to form knowledge regarding the application of FEM in non-linear building mechanics; determination of stability with SAP2000; dynamic research with SAP2000 and Tower 6; modern trends in seismic safety of building structures.
13. Recommended or required reading:
  - Върбанов, Х., Устойчивост и динамика на еластичните системи, С., Техника, 1989
  - Бобев, Т., Устойчивост и динамика на строителните конструкции – лекции за студентите от специалността ССС, 2010, електронен формат
  - Бобев, Т., Ганев, Т., Рангелов, Р. и др., Ръководство по устойчивост и динамика на строителните конструкции, С. Техника, 1993
  - Иванов, А.И., Основи на сеизмичната механика, С., изд. Арте Ново, 2003
  - Иванов, А.И., Динамика на строителните конструкции, С., изд. Авангард Прима, 2010
  - Clough R., Penzien J., Dynamics of Structures, McGraw-Hill, 1993
  - Chopra A., Dynamics of Structures – Theory and Applications to Earthquake Eng., Prentice Hall, 1995
14. Planned learning activities and teaching methods: **lectures, seminars, coursework, contact hours, independent work.**
15. Assessment methods and criteria: combined written and oral examination. The written examination is on one theoretical question, and the oral one includes supplementary clarifying questions, concerning the elaborated course assignments.
16. Language of instruction: **Bulgarian**
17. Work placement(s): **none**