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| Study Programme: Civil Engineering | | | |
| Course Unit Title: Theory of Concrete Structures 1 | | | |
| Course Unit Code: GG25 | | | |
| Name of Lecturer(s): Vukobratović Vladimir, Starčev-Ćurčin Anka | | | |
| Type and Level of Studies: bachelor | | | |
| Course Status (compulsory/elective): mandatory | | | |
| Semester (winter/ summer): winter | | | |
| Language of instruction: english | | | |
| Mode of course unit delivery (face-to-face/distance learning): face-to-face | | | |
| Number of ECTS Allocated: 6 | | | |
| Prerequisites: none | | | |
| Course Aims: Acquiring advanced academic and professional knowledge in the field of the design and detailing of reinforced concrete structures according to ultimate limit states and enabling students to design and detail reinforced concrete cross-sections and members. | | | |
| Learning Outcomes: Students possess advanced academic and professional knowledge in the field of the design and detailing of reinforced concrete structures according to ultimate limit states. They are able to solve problems of different levels of complexity on their own, as well as in communication and interaction with others. They are entrepreneurial and can lead projects of different complexity by respecting the ethical standards of their profession. They have a positive attitude towards lifelong learning and personal and professional development. | | | |
| Syllabus. General characteristics of reinforced concrete structures. Concrete cover to reinforcement. Arranging, shaping, anchoring and lapping of reinforcement. Ultimate limit states in reinforced concrete structures. Ultimate resistance of cross-sections for effects of bending moments and axial forces. Centric and eccentric tension (small eccentricity). Uniaxial bending of rectangular cross-sections without and with axial force. Doubly reinforced rectangular cross-sections. Uniaxial bending of T-sections without and with axial force. Eccentric compression (small eccentricity) and centric compression without buckling effects. Interaction diagrams. Reinforcement of columns. Ultimate resistance of cross-sections for effects of shear forces and moments of torsion. Design of cross-sections for effects of shear forces and moments of torsion. Shaping of shear reinforcement for effects of shear forces and moments of torsion. Ultimate limit state of slender members. Simplified criteria for second order effects. Methods for analysing second order effects. Biaxial bending of columns. Ductility of reinforced concrete cross-sections. | | | |
| Required Reading: Relevant literature in English, tbd | | | |
| Weekly Contact Hours:2 | Lectures: 3 | Practical work: 2 | |
| Teaching Methods: Lectures, practical classes, consultations. The theoretical part of the study material is presented at lectures through presentations of individual thematic units, followed by the appropriate examples from engineering practice for the sake of easier perceiving and understanding. At practical classes, the study material is processed through the solving of practical problems with the active participation of students. In addition to lectures and exercises, consultations are held regularly in order to provide students with answers to additional questions related to the study material. | | | |
| Knowledge Assessment (maximum of 100 points): | | | |
| Pre-exam obligations | points | Final exam | points |
| Attendance | | | |
| Computer exercises | | | |
| Tests (4x) | | | |

