

Study program: Urban Engineering			
Type and level of studies: Bachelor Academic Studies			
Course unit: Concrete and concrete structures			
Teacher in charge: Nenad Grujović, Vladimir Dunić			
Language of instruction: English			
ECTS: 6 ECTS			
Prerequisites: none			
Semester: <i>Summer Semester</i>			
Course unit objective Introducing students with basic properties of reinforced concrete materials. Knowledge and application of principles and methods of calculation and dimensioning of cross sections and elements of reinforced concrete structures.			
Learning outcomes of Course unit Students will be able to independently apply the knowledge about the dimensioning of the cross sections concrete elements and the reinforced concrete structures and analysis of the state of serviceability of reinforced concrete elements.			
Course unit contents <i>Theoretical classes:</i> Material properties, joint work of concrete and steel. Roll of reinforcement in concrete structures, Stress phases during the bending of AB beam. Loading and influence on structures, Safety factor for combined loading cases. Theory of calculation according to the limit states. Central loading of line beams. Eccentric load on line beams without buckling. Large and small eccentricity, Bended line beams – rectangular and T cross section, Single and double reinforcement of cross section. Anchoring of reinforcement. Calculation of reinforcement for reception of shear stresses, Introduction to prestressing of structures. Steel for the prestressing. <i>Practical classes:</i> Exercise (Exercise follow the lectures)			
Literature 1. Lecture notes, Concrete and concrete structures. 2. Eurocode 2: Design of concrete structures - Part 1-1 : General rules and rules for buildings 3. M.D. Kotsovov, M.N. Pavlovic, Structural concrete, Thomas Telford, 1995 4. Group of authors: BAB '87., JUDIMK, Beograd, 1989. 5. D. Najdanović: Betonske konstrukcije, Akademska misao, Beograd, 2015.			
Number of active teaching hours			Other classes: 0
Lectures: 2	Practice: 3	Other forms of classes:	Independent work: 0
Teaching methods			
Examination methods (maximum 100 points)			
Exam prerequisites	No. of points:	Final exam	No. of points:
Student's activity during lectures	5	oral examination	30
Colloquiums	40		
Seminars	25		
Grading system			
Grade	No. of points	Description	
10	91-100	Excellent	
9	81-90	Exceptionally good	
8	71-80	Very good	
7	61-70	Good	
6	51-60	Passing	
5	Less than 51	Failing	