

Study program:	Civil Engineering		
Level of study:	Undergraduate academic studies		
Course title:	Concrete structures I		
Teacher:	Danica, J, Goleš		
Course Status:	Compulsory		
Credits (ECTS):	5		
Prerequisite:	Fundamentals of concrete structures		
Course objective(s):	<p>Extending knowledge about ultimate limit state analysis of slender RC elements and of linear RC elements subjected to biaxial bending. The acquisition of basic knowledge about design of RC elements according to the theory of allowed stresses, with an emphasis on the control of stresses in cross-section. The acquisition of basic knowledge of the time-dependent deformation and rheological models of concrete. Getting to know the calculation procedures of serviceability limit states of RC elements. Acquiring knowledge about the calculation, design, reinforcing and execution of linear RC elements.</p>		
Course outcome(s):	<p>Qualification for independent calculation and adoption of materials, shapes, dimensions and reinforcement of linear RC elements and structures, and their graphical representation for the project of structure.</p>		
Course Content:			
1 st week	Design of cross section of RC elements subjected to biaxial bending.		
2 nd week	Ultimate limit state design of slender RC elements.		
3 rd week	Rheology of concrete.		
4 th week	Calculation of stresses in concrete and reinforcement. General. Axially pressed non-slender and slender elements. Axially tensioned elements. Small eccentricity - pressure and tension force.		
5 th week	Calculation of stresses in concrete and reinforcement of RC elements in bending.		
6 th week	Serviceability limit states design of RC elements. The limit state of cracks.		
7 th week	The limit state of deformations.		
8 th week	Constructing elements and structures - Reliability. Design models. Expansion joints. Design and construction of elements. Effective span and supports. Local load distribution.		
9 th week	Beams and T-beams. Shaping the beams. Reinforcement. Effective flange width. Diagram of reinforcement covering.		
10 th week	Columns and walls. Shaping. Reinforcement.		
11 th week	Partially loaded areas. Hinges in RC structures. Corbels.		
12 th week	Design of RC frame structures.		
13 th week	Detailing of reinforcement in nodes of RC frame structures.		
14 th week	RC truss girders.		
15 th week	RC two-flanged girders.		
	Week by week practice is following lectures		
Literature:	<ol style="list-style-type: none"> 1. Grupa autora: Priručnik za primenu PBAB'87, Građevinska knjiga, Beograd, 1991. 2. EN 1992-1-1:2004 Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings 3. Ž. Radosavljević: Armirani beton 1, Građevinska knjiga, Beograd, 1985. 4. Ž. Radosavljević: Armirani beton 2, Građevinska knjiga, Beograd, 1988. 5. Ž. Radosavljević, D. Bajić: Armirani beton 3, Građevinska knjiga, Beograd, 1989. 6. I. Tomičić: Betonske konstrukcije, Školska knjiga, Zagreb, 1988. 		
Number of hours:			Other classes: 0
Lectures: 3	Exercises: 3	Other forms of teaching: 0	Individual research work: 0
Teaching methods: Lectures, exercises, seminar paper, consultations			
Evaluation of knowledge (maximum 100 points)			
Pre-exam activities	points	Final exam	points
Activity during the lectures	5	Written exam	30
Practical work	5	Oral exam	30
Colloquia and seminar paper	30		