

Course Name: Concrete structures I				
Course Code	Course Status	Semester	ECTS Credits	Number of classes
	Compulsory	V	5	2L+1E+1L
Study programmes: Undergraduate academic studies - study programme Civil Engineering; 6 semesters and 180 ECTS credits.				
Conditioned by other courses: Building materials, Strength of materials I & II.				
Aims of the course: Acquiring knowledge in the field of application, design and construction of concrete and reinforced concrete and prestressed structures.				
Learning outcomes: After passing this course, the student will be able to: 1. Understand the behaviour of concrete and reinforced concrete structures. 2. Apply knowledge, i.e. performs the design of RC elements according to the ultimate limit states (ULS) (for beams, solid slabs and other floor systems)3. Apply knowledge, i.e. performs the design of RC cross sections for shear and torsion effects. 4. Be familiar with basic concepts of nonlinear analysis of RC structures and redistribution of forces and stresses in statically indeterminate structures. 5. Be familiar with basic concepts of Theory of Permissible stress design				
Teacher and assistant: Nebojša Đuranović, Full professor PhD - lecturer Nina Serdar – Teaching Associate, PhD Maja Lausević-Odalović- Teaching Associate, MSc				
Methods of teaching and learning: Lectures, exercises/tutorials, learning, consultations and independent work				
Course content:				
I teaching week	Basic concepts of concrete and reinforced concrete structures.			
II teaching week	Material properties			
III teaching week	Detailing rules for reinforcement			
IV teaching week	Basics of design. Behaviour of RC cross sections and elements with increasing load. Structural analysis – calculation of forces /moments/ stresses/displacements. The concept of structural Reliability: limit state design in conjunction with the partial factor method. Constituent connections			
V teaching week	Stress-deformation field			
VI teaching week	Partially exam I			
VII teaching week	Basic of design according to ultimate limit states			
VIII teaching week	Design of RC cross sections according to ultimate limit states. Cracked sections.			
IX teaching week	Design of RC cross sections according to ultimate limit states. Design for shear and torsion effects.			
X teaching week	Detailing and design of members: particular rules for beams			
XI teaching week	Detailing and design of members: particular rules for solid slabs			
XII teaching week	Detailing and design of members: particular rules for circular slabs and flat slabs with enlarged column head			
XIII teaching week	Other floor systems,			
XIV teaching week	Partially exam II			
XV teaching week	Basics of nonlinear analysis of RC structures and redistribution of forces and stresses in statically indeterminate RC structure			
Student's obligations: Attending of lectures and exercises, elaboration of semester project, passing of pre-exams.				
STUDENTS LOAD				
Per week: 5 credits x 40/30 = 6.67 hours Structure: 2 hours lectures 2 hours exercises 2.67 hours individual work, including consultations	In semester			
	Teaching and final exam: (6.67 hours) x 16 = 106.67 hours Necessary preparations before semester (administration, enrolment etc) 2 x (6.67 hours) = 13.33 hours Total load for the course: 5x30 = 150 hours Additional work for exam preparation in the additional exam session, including passing of correctional exam between 0 and 30 hours (remaining time from the previous issues to the final load for the course of 150 hours) Load structure: 106.67 hours (teaching) + 13.33 hours (preparation) + 30 hours (additional work)			
Literature: Đuranović N.: "Izvod iz predavanja na predmetu Betonske konstrukcije I", oktobar 2004. godine. Grupa autora: BETON I ARMIRANI BETON PREMA BAB 87, knjiga 1 i 2, Građevinska knjiga Beograd 1991. Radosavljević Ž., Bajić D.: ARMIRANI BETON, knjiga 3, Građevinska knjiga, 1988. F.K. Kong and R.H. Evans: "REINFORCED AND PRESTRESSED CONCRETE" Van Nostrand Reinhold UK,1987 Ačić M., Pakvor A., Perišić Ž.: TEORIJA ARMIRANOBETONSKIH I PRETHODNO NAPREGNUTIH KONSTRUKCIJA, Građevinski fakultet Beograd, Građevinska knjiga, 1986.7. MEST/JUS standards				
Examining system and grading: Examining is continuous during the semester and in the final exam. Maximum number of points in semester: 100. Maximum number of points at final exam: 50. The structure of examination and points is as follows: - classes attendance: from 0 to 5 points (100% attendance= 5 points, less than 30% attendance= 0 points) - semester project: from 3 to 15 points (min positively marked part of semester project = 3 points); - pre-exams: 2 x 15 = 30 points - final exam: up to 50 points Pre-exams and final exam are in written form. Positive grade is obtained for min 50 points.				
Special notes for the course:				
Data prepared by Lecturer				
Note: Further information on the subject can be obtained from the subject Lecturer, teaching associate, head of the study programme and vice-dean for teaching.				