ERASMUS+
EU programme for education, training, youth and sport

Incoming student mobility

Name of UNIOS University Unit:

COURSES OFFERED IN FOREIGN LANGUAGE
FOR ERASMUS+ INDIVIDUAL INCOMING STUDENTS

Department or Chair within the UNIOS Unit	Department of Materials and Structures

Study program	Civil engineering

Study level (bachelor/master)	Graduate University Studies in Civil Engineering/master

Course title	Prestressed Concrete
Course code (ISVU)	294966
Language of instruction	English
Course content	Definition. Why must steel have high strength? Characteristics of materials. Achieving prestressing. Necessity of the eccentric position of the tendon (cable). Behavior of a concrete cross-section under increasing external load. Effect of tendons on a concrete beam. Basic principles of statics used in the mechanics of prestressed concrete. Required cross-sectional geometry. Required prestressing force. Tendon profile and layout. Prestressing force losses and reductions. Ultimate bending capacity of a prestressed concrete cross-section. Effect of shear force. Bursting forces at the anchorage zone where the prestressing force is introduced. Prestressing steels and prestressing systems. Statically indeterminate structures (SIS). Methods for determining internal forces in SIS. Ultimate load-bearing capacity of SIS. Concept of the plastic hinge. Degrees of prestressing – partial prestressing. Notable prestressed concrete structures in Croatia and around the world.

	Design calculation example.
Prerequisites for enrolment (if any)	
Learning outcomes	Predict the behavior of a prestressed concrete beam. Determine the number and position of prestressing tendons. Perform the design and analysis of a prestressed concrete beam. Select and adapt an appropriate structural system. Determine the degree of prestressing.
Basic Literature	Aničić, D.: Prednapeti beton, Osijek, 2003. (skripta)
Additional Literature	Marić, Z., Sesar, P.: Riješeni primjer proračuna prednapetog betonskog nosača, Zagreb, 1987. (interno izdanje) Leonhardt, F.: Prednapregnuti beton u praksi, Beograd, Građevinska knjiga, 1965.
Form of teaching	Lectures Exercises (or Practical sessions) Independent assignments (or Individual tasks)
Form of assessment	Written examination Oral exam
Number of ECTS	5
Class hours per week	2+2
Period of realization (summer/winter semester)	winter
Teacher(s) + Email address	prof. dr. sc. Damir Varevac dvarevac@gfos.hr izv. prof. dr. sc. Hrvoje Draganić draganic@gfos.hr
Assistant(s) + Email address(es)	