

Subject Title: Prefabricated Elements of Reinforced Concrete

Basic information on the subject	
Academic unit:	Faculty of Civil Engineering
Subject title:	Prefabricated Elements of Reinforced Concrete
Level:	Master
Subject status:	Elective (E)
Year of studies:	First Year
Number of classes per week:	2+1
Credits - ECTS:	3
Time / location:	According to time table
Teacher:	Prof.ass.Dr. Florim Grajcevci
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Course description:	<p>The importance, advantages and disadvantages of prefabricated reinforced concrete structures. The different structural types erected by the structural elements and/or the sub-structures jointed to each other. Connections of prefabricated structural elements according to designed static schemes. Joints of frames - columns - beams. Forming - Design of reinforced concrete structures with prefabricated elements and substructures. Study and analysis for the feasibility of using prefabricated structures, design concept.</p> <p>Prefabricated frame systems, Prefabricated panel-wall systems, Prefabricated "BOX" systems. Non-structural and structural elements of facades of prefabricated buildings made from reinforced and were decorated concrete.</p> <p>Descriptions of precast reinforced concrete elements, their formation, transportation, assembly and maintenance. Prefabricated and pre-stressed elements of reinforced concrete. Computation of prefabricated structures and structural elements according to European standards according to limit state EN 1990 and other standards EN 1991, EN1992, EN 1997 and EN 1998.</p>
Course objectives:	<p>The huge broad of spectrum of structures are targets for the students of Master study program to aim the fulfillment of knowledge. The development of knowledge of structures, namely prefabricated structural elements from reinforced concrete, fulfills students with other knowledge and concepts compared to the construction of classic or traditional structures. This course prepares students with knowledge of the design and calculation of structures contains the prefabricated elements and substructures, their erection, the connection of joints between structural and non-structural elements.</p> <p>Rapid technological developments in the labor market require</p>

engineers to be prepared to carry out analysis and field studies according to financial requirements, transportation, speed of construction and this course equips the student with this knowledge. The independent realization of the student's semester work for the design, calculation and construction of objects from pre-prepared elements is the rounded goal of this subject.

- Expected learning outcomes:**
- After completing this course (subject), the student:
- Analyzes the construction of structures with prefabricated elements.
 - Designs prefabricated structures and structural elements from reinforced concrete
 - Designs connections of prefabricated structural and non-structural elements.
 - Applies European standards for calculation of structures and their elements.
 - Interprets the results of the design of the structure and prefabricated structural elements.

Workload that falls on the student (shall correspond with Student Learning Outcomes)

Activity	Class hours	Days / Weeks	Total
Lectures	2	1	30
Theory / Laboratory work / Exercises	1	1	15
Practical work			
Preparation for an intermediate test			
Consultation with the teacher	1	3	3
Field work	1	4	4
Test, seminar paper	2	4	8
Home work	2	2	4
Individual learning (in the library or at home)	2	1	2
Preparation for the final exam	1	3	3
Evaluation time (test, quiz, final exam)	1	2	2
Projects, presentations, etc.	2	2	4
Add any other activity that is not on the chart ...			
Total			75

Teaching methods: *Lectures, visits to factories producing prefabricated elements and buildings, exercises, tests, student presentations from individual seminar work.*

Evaluation methods:

Presence (L+U):	15%
Seminar Work	35%
Presence in site	10%

	First presentation	5%
	Second presentation	5%
	Theoretical part of exam	30%
Basic literature:		
	<ul style="list-style-type: none"> - Authorized lectures - EN1990, EN1991, EN1992, EN1998, EN1998 - Design and typical details of connections for precast and prestressed concrete, PCI Committee on Connection Details, Chicago - Precast Concrete Elements for Accelerated Bridge Construction, Report January 2009, Iowa State University USA 	
Additional literature:		
	<ol style="list-style-type: none"> 1. Architecture in precast Concrete, Singapore Institute of Architecture 2. How to Design Concrete Structures using the Eurocode 2, group of Authors, A cement and Concrete Industry publication K.Elliott, Precast Concrete Structures, CRC press Web site at www.creppress.com 	

Curriculum development	
Week	Lecture title
Week 1:	Introduction The importance of building prefabricated construction. The advantages and disadvantages of the construction of structures, respectively prefabricated elements.
Week 2:	Technical, financial, transport analysis in the use of prefabricated reinforced concrete elements.
Week 3:	Concept Design of prefabricated building.
Week 4:	Structural systems possible for execution with prefabricated reinforced concrete elements.
Week 5:	Prefabricated reinforced concrete elements for foundations of structures.
Week 6:	Plates, mezzanine, covers from pre-prepared reinforced concrete.
Week 7:	Prestressed reinforced concrete elements.
Week 8:	Prefabricated linear concrete elements, Column.
Week 9:	Prefabricated linear concrete elements, Beams.
Week 10:	Prefabricated substructures of "BOX" systems from RC. Stairs, elements of the facade, thin walls, pillars, etc.
Week 11:	Designing the connections of structural elements prevaricated by RC Frame systems.
Week 12:	Visit to the factories where the elements and objects prefabricated by RC are produced.
Week 13:	Visit to the factories where the elements and objects prefabricated by RC are produced.
Week 14:	Design of prefabricated structures depending on different conditions.
Week 15:	Analysis of EN 1998 standards criteria for the design of prefabricated structures in seismic areas.

Academic Policies and Code of Conduct

Tools used during lessons should be cleaned and appropriately stored at the end of the class lesson.

Mobile / smart phones and other electronic devices (eg iPods) should be turned off (or silent mode) and not exposed during school hours.

Laptops and tablet computers are only allowed to be used silently; other activities such as checking personal email or browsing websites are prohibited.