COURSE DESCRIPTION

Name of the Course:	Prestressed and composite steel-concrete structures							
Specialization Code:	**U02.07.ICV.IZ.M24.**			**Course Code:**	**1.DD.OB05**			
Year of study:	**1**	**Semester:**	**1**	**Examination form:** (**E**-Exam; **Co**- Colloquy; **P**-Project**; P/F**-Passed/Failed)	**E**	**ECTS credits granted (CR):**	**E (Co)**	**6**
							P (P/F)	
Course Category: (**DF**- Fundamental; **DD**- General engineering; **DS**-Specialty engineering; **DC**-Complementary; **PR**-Practical stage)								**DD**
Course Type: (**OB**-Compulsory**; OP**-Elective**; FC**-Facultative)								**OB**
Number of hours per semester: Total of hours per week (TH) x Number of weeks per semester								
TOTAL :	140	**Individual study** (IS)**:**		84	**Contact hours (C + S;L;P):**			56
Academic staff member in charge: (Full name, Academic position and Department)	*Radu PASCU, Professor, Reinforced Concrete Structures*							

Faculty	**Engineering in foreign languages Master study programme**		**Number of contact hours per semester**				
			Total	Course	Seminar	Laboratory	Project
Field	**Civil Engineering**						
Specialization	**Structural Engineering**		56	28	14	14	

Course objectives - Description of the main competences: Development of the capacity to design prestress concrete members and composite steel-concrete members	
Content description:	
1. COURSE	Part I: Prestressed concrete 1. Introduction. Principle of prestressing. Pre- and post-tensioned reinforcement. Degree of prestress. 2. Materials and devices for prestressed concrete. 3. Losses of prestress for pre- and for post-tensioning 5. Behaviour of prestressed members under loads. PC ties and PC beams. 6. Verification of PC members at ULS: bending and shear. 7. Verification of PC members at SLS: cracking and deformation. 8. Design of anchorage zones. Part II: Composite steel-concrete 1. Introduction. Types of composite members. 2. Design of composite steel-concrete beams. 3. Design of composite steel-concrete columns. 4. Bond verification in composite members 5. Shear design of composite steel-concrete walls.
2. Seminar / Laboratory / Project / Practical stage	1. Design of a PC pre-tensioned beam for commercial hall with large spans. 2. Design of a steel-concrete 1 story composite frame.

3. Bibliography	1. EN 1992-1-1: 2004 - Design of concrete structures – Part 1-1: General rules and rules for buildings 2. EN 1994-1 – Design of composite steel and concrete structures 3. L.H. Martin and J.A. Purkiss, Concrete Design to EN 1992, 2nd ed., Elsevier, 2006 4. W.H Mosley, J.H. Bungey and R. Hulse, Reinforced Concrete Design to Eurocode 2, 6th edi., Palgrave MacMillan, 2007 5. R.P. Johnson, Composite Structures of Steel and Concrete, 3rd ed., Blackwell, 2004 6. Orakcal, K., Massone, L., Wallace, J. (2006). Analytical modeling of reinforced concrete walls for predicting flexural and coupled - shear - flexural responses. PEER report 2006/07. http://peer.berkeley.edu/publications/peer_reports/reports_2006/web_PEER607_ORAKCAL_mass_wallace.pdf 7. Design of reinforced concrete structures.IIT Kharagpur course. http://freevideolectures.com/Course/2686/Design-of-Reinforced-Concrete-Structures 8. Mechanics and design of concrete structures - lecture notes. MIT open courseware. http://ocw.mit.edu/courses/civil-and-environmental-engineering/1-054-mechanics-and-design-of-concrete-structures-spring-2004/

Criteria to be considered for the final mark	**Weight of each criterion in the final mark (%)**
1. Exam defence (final examination)	50
2. Appreciation during the entirely semester	
2.1 Seminar activity	25
2.1 Laboratory activity	25
2.2 Project activity (the project has not a distinct final mark)	
3. Periodical examinations	
3.1 Written / oral examination	
3.2 Home works, reports, essays etc.	
4. Other criteria (to be specified)	
Short description of the final evaluation procedure:	

Estimation of the total number of hours per semester requested for the individual study (IS)				
Type of individual activity	No. of hours		Type of individual activity	No. of hours
1. Study of the course notes	14		8. Preparation of the final examination	21
2. Study of the compulsory bibliography	14		9. Advisory class participation	2
3. Study of the supplementary bibliography			10. Practical documentation on site	
4. Preparation of specific activities	21		11. Additional documentation on library	6
5. Preparation of home works			12. Internet network documentation	6
6. Preparation of periodical written examinations			13. Others (to be specified)	
7. Preparation of periodical oral examinations			**TOTAL number of hours**	84

Signature of the Academic Staff member in charge:

Date: March 2013

Radu PASCU