COURSE DESCRIPTION

Name of the Course:	**RETROFITTING OF STEEL STRUCTURES**							
Specialization Code:	**U02.07.ICV.IZ.M24.**			**Course Code:**	**3.DS.OP13**			
Year of study:	**2**	**Semester:**	**3**	**Examination form:** (**E**-Exam; **Co**- Colloquy; **P**-Project**; P/F**-Passed/Failed)	**E**	**ECTS credits granted (CR):**	**E (Co)**	**7**
					P		**P (P/F)**	
Course Category: (**DF**- Fundamental; **DD**- General engineering; **DS**-Specialty engineering; **DC**-Complementary; **PR**-Practical stage)								**DS**
Course Type: (**OB**-Compulsory**; OP**-Elective**; FC**-Facultative)								**OP**
Number of hours per semester: Total of hours per week (TH) x Number of weeks per semester								
TOTAL :	112	**Individual study** (IS)**:**		56	**Contact hours (C + S;L;P):**			56
Academic staff member in charge: (Full name, Academic position and Department)				*Şerban DIMA, Ph.D., C. Eng., Professor*				

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			28

Course objectives - Description of the main competences:

- Getting familiar to estimating the physical state of a steel structure in use
- Getting familiar to proposing retrofitting solutions
- Getting familiar to realizing of a retrofitting project

Content description:

1. COURSE	**COURSE 2 hours/week x 14 weeks = 28 hours** 1. Reliability of metal structures. Retrofitting of metal structures ..... 6 hours 2. Methodology of analysing the physical state of a metal structure ..... 6 hours 3. Defects of metal structures, causes of defects ..... 6 hours 4. Retrofitting principles for steel structures ..... 2 hours 5. Types of solutions for retrofitting steel structures ..... 6 hours 6. Labour safety for retrofitting steel structures ..... 2 hours
2. Seminar / Laboratory / Project / Practical stage	**PROJECT 2 hours/week x 14 weeks = 28 hours** A1 : Retrofitting a metal member by increasing the cross-section ..... 4 hours A2 : Retrofitting a metal member by introducing preloading devices ..... 4 hours A3 : Retrofitting a metal member (structure) by changing the static scheme . 6 hours A4 : Retrofitting a corroded metal member, estimating the capacity of a corroded metal member ..... 4 hours A5 : Retrofitting a metal member by reducing the buckling length ..... 4 hours A6 : Retrofitting a metal member by changing the stiffness of the components ..... 4 hours A7 : Estimating the material and labour costs for retrofitting a metal structure; comparison to a new structure; efficiency of retrofitting ..... 2 hours
3. Bibliography	1. EN 1998-1 – Eurocode 8: Design of structures for earthquake resistance – Part 1: General rules, seismic actions and rules for buildings 2. EN 1998-3 – Eurocode 8: Design of structures for earthquake resistance – Part 3: Assessment and retrofitting of buildings 3. Muir, L. Rehabilitation and retrofit of existing steel buildings. http://www.larrymuir.com/Documents/Existing%20Structures.pdf 4. FEMA 273. (1997). NEHRP guidelines for the seismic rehabilitation of buildings. http://www.wbdg.org/ccb/DHS/ARCHIVES/fema273.pdf 5. V.Popescu, N. Patriniche, E Chesaru *Calitatea şi siguranţa construcţiilor metalice*, Ed.Tehnică, 1986. 6. E.Chesaru, D. Preda *Expertizarea şi consolidarea construcţiilor metalice*, Ed. Conspres, UTCB, 1998.

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	
2.1 Laboratory activity	30 %
2.2 Project activity (the project has not a distinct final mark)	
3. Periodical examinations	
3.1 Written / oral examination	20 %
3.2 Home works, reports, essays etc.	
4. Other criteria (to be specified)	
Short description of the final evaluation procedure: The final evaluation consists of a written examination, where two or three subjects must be solved, the final mark being an average value of the grades for each subject; in some cases, discussions on the subjects may be involved.	

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	10		8. Preparation of the final examination	20
2. Study of the compulsory bibliography	5		9. Advisory class participation	2
3. Study of the supplementary bibliography	5		10. Practical documentation on site	-
4. Preparation of specific activities	14		11. Additional documentation on library	-
5. Preparation of home works	-		12. Internet network documentation	-
6. Preparation of periodical written examinations	-		13. Others (to be specified)	-
7. Preparation of periodical oral examinations	-		**TOTAL number of hours**	56

Date:
25.03.2013

Signature of the Academic Staff member in charge:
Şerban DIMA