SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Faculty of Civil Engineering
1.3	Department	Structures
1.4	Field of study	Civil Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	CCIA English/Engineer
1.7	Form of education	Full time
1.8	Subject code	31.00

2. Data about the subject

2.1	Subject name			Reinforced and Prestressed Concrete I			
2.2	Subject area			Civil Engineering			
2.3	Course responsible/lecturer			Lecturer phd.eng. Olar Radu – radu.olar@dst.utcluj.ro			
2.4	Teachers in charge of seminars			Dumitru Moldovan			
2.5 Year of study	2	2.6 Semester	2	2.7 Assessment	C	2.8 Subject category	DD DI

3. Estimated total time

3.1 Number of hours per week	5	3.2 of which, course:	3	3.3 applications:	2
3.4 Total hours in the curriculum	70	3.5 of which, course:	42	3.6 applications:	28
Individual study					24
Manual, lecture material and notes, bibliography					6
Supplementary study in the library, online and in the field					9
Preparation for seminars/laboratory works, homework, reports, portfolios, essays					6
Tutoring					7
Exams and tests					2
Other activities					1

3.7	Total hours of individual study	55
3.8	Total hours per semester	125
3.9	Number of credit points	5.0

4. Pre-requisites (where appropriate)

4.1	Curriculum	
4.2	Competence	The strength of materials and statisc knowledges.

5. Requirements (where appropriate)

5.1	For the course	
5.2	For the applications	

6. Specific competences

Professional competences	The physical and mechanical properties of the concrete and reinforcements The ultimate and serviceability limit states of the reinforced concrete elements subjected to different loads The rules of the Eurocode 2 regarding the design of reinforced concrete elements
Cross competences	- to realise destructive and nondestructive tests on simple concrete, reinforcement and reinforced concrete elements, - to design the reinforced concrete elements subjected to different types of loads - to check the reinforced concrete elements to the ultimate and serviciability limit states

7. Discipline objectives (as results from the *key competences gained*)

7.1	General objective	The proper knowledge of specific terms in the concrete design domain
7.2	Specific objectives	to be able to design reinforced concrete structural elements

8. Contents

8.1. Lecture (syllabus)		Teaching methods	Notes
1.	Introductive Lecture 1	The courses are presented both in a traditional and multimedia way, the students can interfere with questions and discussions are possible	
2.	Introductive Lecture 2		
3.	Definition of the Limit State. Factors of Safety. Analysis of the Structure. Analysis of the Section.		
4.	Materials. Concrete.		
5.	Materials. Steel reinforcements.		
6.	Work stages. Theory of Bending.		
7.	Reinforced Concrete Beams. Capable moment. Singly reinforced sections.		
8.	Reinforced Concrete Beams. Double reinforced sections. Flanged Section in Bending.		
9.	Reinforced Concrete Beams. Shear behaviour.		
10.	The design of reinforced concrete elements to shear force.		
11.	Torsion design of reinforced concrete elements.		
12.	Reinforcing rules and presciptions for beams.		
13.	Serviciability Limit States.		
14.	Control of Cracks Widths. Calculation of Deflection.		

Bibliography

In the UTC-N library

1. T. Oneţ, Radu OLAR – Reinforced Concrete Handbook part.1, UT Press 2010
2. T.Oneţ, R.Olar – Beton Armat, UTPress 2003
3. Z. Kiss, T. Oneţ – Proiectarea structurilor de beton după SR – EN 1992-1, Abel 2008
4. G. Viorel, C. Măgureanu, Z. Kiss – Îndrumător laborator, litografie IPCN, 1983
5. C. Măgureanu, T. Oneţ – Betonul, UTPres, 1996
6. T. Oneţ, T. Clipii, A. Cuciureanu – Betonul structural, Editura Societatea Academică MATEIU BOTEZ, Iaşi 2006
7. I. Cadar, T. Clipii, A. Tudor – Beton Armat, Timişoara, 1999

Virtual didactic materials

1. Movies with tests on reinforced concrete elements.

8.2. Applications/Seminars		Teaching methods	Notes
1.	Introduction. Safety rules. Concrete mixture receipt for experimental elements.	Direct involvement of the student in the problems solving process	
2.	Practical work – the reinforcements for test elements		
3.	Practical experiments – the cast in of a test reinforced concrete beam		
4.	The design of a reinforced concrete beam, simply supported (1)		
5.	The design of a reinforced concrete beam, simply supported (2)		
6.	The design of a singly reinforced concrete beam – rectangular section		
7.	The design of a double reinforced concrete beam – rectangular section		
8.	The design of a singly reinforced concrete beam – T section		
9.	Test 1 – The design of a simply supported beam to bending moment.		
10.	The design to shear force (1)		
11.	The design to shear force (2)		
12.	Test 2 – The design to shear force of a simply supported beam.		
13.	Experimental test on the initial reinforced concrete beam		
14.	Resume. Tests recoveries.		
Bibliography			

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

During the semester period, visits on the construction sites can be organised in order to be presented to students practical aspects related with the execution and structural design of the structural reinforced and prestressed elements. Direct contact with the representatives of the companies are possible.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
Course	Quality evaluations performed by analysis, synthesis, generalization of data obtained through its own investigation and acquirements	The evaluation consist in the knowledges verification, the problems solving and theory (questions), in writing (1.00+1.00 hours)	Problem (P) – 20% Theory (T) – 60%
Applications	Test 1 (week 9)	Application test	(t1) – 10%
	Test 2 (week 12)	Application test	(t2) – 10%
10.4 Minimum standard of performance: $N = 0.6 \cdot T + 0.20 \cdot P + 0.10 \cdot t1 + 0.10 \cdot t2 \geq 5.00$			
($t1 \geq 5$, $t2 \geq 5$, $P \geq 5$ and $T \geq 5$)			

Date of filling in:		**Title Surname Name**	**Signature**
09.10.2019	Lecturer	PhD.Eng. Radu OLAR	
	Teachers in charge of application	Phd.Eng. Dumitru Moldovan	

Date of approval in the department ……..	Head of department Conf. Dr. Ing. Attila Puskás
Date of approval in the faculty ……	Dean Conf.dr.ing. Nicolae CHIRA