SYLLABUS [1]

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty[2]/ Department [3]	Faculty of Civil Engineering / Department of Civil Engineering and Buiding Services
1.3 Chair	—
1.4 Field of study (name/code[4])	Civil Engineering / 80
1.5 Study cycle	bachelor
1.6 Study program (name/code/qualification)	Civil Engineering (in English) / 10 / Engineer

2. Information about the discipline

2.1 Name of discipline/ formative category[5]			Concrete 1 / DD				
2.2 Coordinator (holder) of course activities			Prof.dr.ing. NAGY-GYÖRGY Tamás				
2.3 Coordinator (holder) of applied activities[6]			Sl.dr.ing. DĂESCU Cosmin				
2.4 Year of study[7]	3	**2.5** Semester	5	**2.6** Type of evaluation	E	**2.7** Type of discipline[8]	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) [9]

3.1 Number of fully assisted hours / week	5 of which:	**3.2** course	2.5	**3.3** seminar / laboratory / project	2.5
3.1* Total number of fully assisted hours / semester	70 of which:	**3.2*** course	35	**3.3*** seminar / laboratory / project	35
3.4 Number of hours partially assisted / week	of which:	**3.5** training		**3.6** hours for diploma project elaboration	
3.4* Total number of hours partially assisted / semester	of which:	**3.5*** training		**3.6*** hours for diploma project elaboration	
3.7 Number of hours of unassisted activities / week	3 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0.5
		hours of individual study after manual, course support, bibliography and notes			2
		training seminars / laboratories, homework and papers, portfolios and essays			0.5
3.7* Number of hours of unassisted activities / semester	42 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			7
		hours of individual study after manual, course support, bibliography and notes			28
		training seminars / laboratories, homework and papers, portfolios and essays			7
3.8 Total hours / week [10]	8				
3.8* Total hours /semester	112				
3.9 Number of credits	5				

[1] The form corresponds to the Discipline File promoted by OMECTS 5703 / 18.12.2011 and to the requirements of the ARACIS Specific Standards valid from 01.10.2017.
[2] The name of the faculty which manages the educational curriculum to which the discipline belongs
[3] The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.
[4] The code provided in HG no.140 / 16.03.2017 or similar HGs updated annually shall be entered.
[5] Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).
[6] Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).
[7] Year of studies in which the discipline is provided in the curriculum.
[8] Discipline may have one of the following regimes: imposed discipline (DI), optional discipline (DO) or optional discipline (Df).
[9] The number of hours in the headings 3.1 *, 3.2 *, ..., 3.8 * is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≥ 28 hours / wk. and (3.8) ≤ 40 hours / wk.
[10] The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

4. Prerequisites (where applicable)

4.1 Curriculum	• Material Science 1&2, Mechanics of materials 1&2, Structural Analysis 1
4.2 Competencies	• Stress analysis, cross section design for bending and bending with axial force.

5. Conditions (where applicable)

5.1 of the course	• High capacity classroom, laptop, projector, whiteboard
5.2 to conduct practical activities	• Classroom with min 30 person capacity, whiteboard, equipped laboratory

6. Specific competencies acquired through this discipline

Specific competencies	• Acquire skills of theoretical and practical calculation of designing reinforced concrete structures
Professional competencies ascribed to the specific competencies	• Recognizing typical structures and structural elements, specific to the graduated study programme • Design of structural elements in civil engineering, specific to graduated study programme
Transversal competencies ascribed to the specific competencies	• Documentation in Romanian and foreign language, in view of professional and personal development, via continuous learning and efficient adaptation to the new technical specifications

7. Objectives of the discipline (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	• Acquire knowledge about basics of reinforced concrete in conformity to European Norms. Design of structural elements from reinforced concrete.
7.2 Specific objectives	• Design characteristics of concrete, reinforcement, reinforced concrete and behaviour of reinforced concrete under ultimate loads; calculation and detailing of reinforced concrete elements. Acquire skills of theoretical and practical calculation. Documentation in foreign languages and adaptability to new technical specifications.

8. Content [11]

8.1 Course	Number of hours	Teaching methods [12]
Introduction in Reinforced Concrete	2	projections, discussions,

[11] It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".
[12] Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

Concrete - Types, Strength and deformation of concrete	4	demonstrations
Reinforcement – Types and properties of reinforcing steel	2	
Reinforced Concrete – Anchorage, Working stages, Durability of RC	5	
Basics of design – Review, LSM, Verifcations, Actions	1	
Design characteristics of concrete and steel reinforcements	2	
Bending with axial force – basics, strain states, design cases, M-N curve	3	
Beams – Simple and double reinforced rectangular cross section, T cross section – design and verification	3	
Columns – imperfections, 2nd order effect, slenderness, effective length, com, prevailing bending with compression, biaxial bending	3	
Shear force – design for shear, special cases	5	
Detailing rules for beams and columns	1	
Applications, design examples – simple supported beam design, shrinkage, creep, confinement	4	

Bibliography [13]

1. Nagy-György T, Reinforced Concrete 1, Course material, 2017 (840 pg)
2. EN 1992-1-1: Design of concrete structures - Part 1-1: General rules and rules for buildings
3. Eurocode 2: Background & Applications, Design Of Concrete Buildings - Worked examples, 2014, ISBN 978-92-79-36548-5
4. fib Model Code for Concrete Structures 2010, (434 pg), 2013, ISBN: 978-3-433-03061-5

8.2 Applied activities [14]	Number of hours	Teaching methods
Concrete compression strength: determinations on cube, cylinder, prism. Tests and interpretation of the results.	3	projections, conversations, demonstrations, experimental tests
Concrete tensile strength: determinations on prism and cylinder. Tests and interpretation of the results.	2	
Modulus of elasticity: determinations on cylinder and prism. Tests and interpretation of the results, domains of use.	3	
Reinforcements: types, characteristics	1	
Bond: determination of the bond. Tests and interpretation of the results.	1	idem
Design and detailing of a RC beam. Computation of the control values. Test of a RC beam, measurements and interpretation of the results.	10	idem
Applications regarding cross section design.	15	idem

Bibliography [15]

1. Nagy-György T, Reinforced Concrete 1, Course material, 2017 (840 pg)
2. EN 1992-1-1: Design of concrete structures - Part 1-1: General rules and rules for buildings
3. Eurocode 2: Background & Applications, Design Of Concrete Buildings - Worked examples, 2014, ISBN 978-92-79-36548-5
4. fib Model Code for Concrete Structures 2010, (434 pg), 2013, ISBN: 978-3-433-03061-5

[13] At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.
[14] Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".
[15] At least one title must belong to the discipline team.

9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

- Compatibility with educational programs of Technische Universität München , Fakultät für Bauingenieur- und Vermessungswesen; Universite de Liege, Faculty of Applied Sciences; Budapest University of Technology and Economics, Faculty of Civil Engineering

10. Evaluation

Type of activity	**10.1** Evaluation criteria [16]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	Quality of the theoretical subjects and the numerical applications	Written: theoretical subjects and numerical calculus Oral: theoretical subjects	67%
10.5 Applied activities	**S:**		
	L: Results of the control tests	Evaluation tests + homeworks	33%
	P[17]**:**		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [18])			
• Minimum grade : 5			

Date of completion 15.01.2018	**Course coordinator (signature)** ……	**Coordinator of applied activities (signature)** ……
Head of Department (signature) ……	**Date of approval in the Faculty Council [19]** 12.02.2018	**Dean (signature)** ……

[16] Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

[17] In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.

[18] It will not explain how the promotion mark is awarded.

[19] The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.