MINISTRY OF EDUCATION

TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA, ROMANIA

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	Civil Engineering and Management
1.4	Field of study	Civil Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Civil Engineering/ Engineer
1.7	Form of education	Full time
1.8	Subject code	39.00

2. Data about the subject

2.1	Subject name			Timber Structures				
2.2	Subject area			Civil Engineering				
2.3	Course responsible/lecturer			Senior lecturer Ph.D. Eng.MSc Ruxandra Dârmon Ruxandra.Darmon@ccm.utcluj.ro				
2.4	Teachers in charge of seminars			Senior lecturer Ph.D. Eng.MSc Ruxandra Dârmon Ruxandra.Darmon@ccm.utcluj.ro				
2.5 Year of study		I	2.6 Semester	1	2.7 Assessment	Exam	2.8 Subject category	DS/DOB

3. Estimated total time

3.1 Number of hours per week	3	3.2 of which, course:	2	3.3 applications:	1
3.4 Total hours in the curriculum	42	3.5 of which, course:	28	3.6 applications:	14
Individual study					hours
Manual, lecture material and notes, bibliography					28
Supplementary study in the library, online and in the field					-
Preparation for seminars/laboratory works, homework, reports, portfolios, essays					28
Tutoring					2
Exams and tests					4
Other activities					-

3.7	Total hours of individual study	62
3.8	Total hours per semester	104
3.9	Number of credit points	4

4. Pre-requisites (where appropriate)

4.1	Curriculum	Statics I and II, Material Strength I and II
4.2	Competence	N/A

5. Requirements (where appropriate)

5.1	For the course	N/A
5.2	For the applications	N/A

6. Specific competences

Professional competences	Theoretical Knowledge (must	Quality Evaluation of Timber structures Must know the advantages and disadvantages of featuring wood in constructions Must know trial equipments and methods on wood and to interpret/explain results Must know the technology of wood to wood and wood to metal connections Must know the typical sections used in wood constructions
	Gained Knowledge (know what to do)	At the end of the course the students will be capable of: Evaluating specified loads (permanent, temporary: long, medium, short term, instanteneous) that act upon wood constructions Designing and calculating (dimensioning) of elements and assemblies of wood in bending (in one or two directions), tension, compression with no eccentricity and bending with compression Designing and calculating (dimensioning) of wood connections
	Abilities (know what to use)	At the end of the course the students will be capable of: Applying current Building Codes in designing some elements and assemblies of wood construction and wood structure connections design, as well, Checking if wood connections were correctly or incorrectly done; Presenting/writing a technical report including calculations and material quantities
Cross competences	Team work skills when participating in complex projects, following the technical and scientific requirements of the activity, problem solving of specific issues of wood structures and distribution/delegation of tasks to personnel working under supervision.	

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

7.1	General objective	The development of competences considering safety requirements and life time expectancy of timber constructions
7.2	Specific objectives	Gaining theoretical knowledge regarding timber elements design and specific wood connection design as well.

8. Contents

8.1. Lecture (syllabus)		Teaching methods	Notes
1.	Introduction in economics of forestry. Advantages and disadvantages of wood construction. Classification of wood constructions. Physical and mechanical properties. Classification of wooden materials. Wood defects and strength classes. Pest control, fungus control and fire control of elements for wood construction	Power Point presentation	Video – projector
2.	Mechanical proprieties of wood for construction at different loads and the factors that influence the se proprieties.		

3.	Structural wood elements with simple cross section. Building roof framing		
4.	Design of elements with simple cross section according to sr en 1995-1-1.		
5.	Connections used in wood constructions. Connection/jointures binding rules. Design and calculation of carved connections		
6.	Connections used in wood constructions. Design and calculation of connections with splines. Design and calculation of connections with rods.		
7.	Connections used in wood constructions. Design and calculation of glued connections.		
8.	Design of elements with built-up section. Connectors and metallic elements used in jointures.		
9.	Constructions from plane elements. beams – design and calculation		
10.	Constructions from plane elements. trusses – design and calculation		
11.	Constructions from plane elements. frames – design and calculation		
12.	Constructions from plane elements. arches – design and calculation		
13.	Bracing structures of plane elements		
14.	Tridimensional constructions. Folded surfaces. Domes. - design and calculation		

Bibliography

1. Porteous J., Kermani A. – *Structural Timber Design to Eurocode 5,* 2nd. Edition, Wiley-Blackwell, 2013.
2. Isopescu D. – *Structural design with timber,* Ed Universitatii Tehnice din Iasi, 1994.
3. Hughes T., Steiger L, Weber J – *Timber Construction: details, products, case studies,* Ed. Birkhauser, Basel, 2008
4. Natterer, J., ş.a. – *CONSTRUCTION EN BOIS,* Laussane, Elveţia
5. Mc Kenzie W.M.C, Zhang B., - *Design of structural timber to Eurocode 5,* 2nd. Edition, London, New York: Palgrave Macmillan, 2007
6. Standards, Norms, Specific Technical Regulations (SR EN 1995-1-1-2005, SR EN 338-2004, SR EN 1990-2004, SR EN 1991-1-1-2004, SR EN 1991-1-3-2005, SR EN 1991-1-4-2006)

8.2. Applications		Teaching methods	Notes
1.	Work protection and safety technique regulation.	Laboratory work presentation and applications	Laboratory works
2.	Units of measurement.		
3.	Determining the physical-mechanical characteristics: mass, weight, volume.		
4.	Calculation of the density; apparent density, bulk density, compactness and porosity.		
5.	Determination of voids volume, humidity, water absorption.		
6.	Determination of the specific surface using the Blaine permeameter.		
7.	Solutions and concentrations.		
8.	Determination of the quality of water.		

9.	Non-destructive tests using mechanical surface methods.		
10.	Non-destructive tests using ultrasonic methods.		
11.	Mechanical tests, practical examples.		
12.	Tests and determinations on sand.		
13.	Tests and determinations on gravel.		
14.	Final evaluation.		

Bibliography

1. Porteous J., Kermani A. – *Structural Timber Design to Eurocode 5*, 2nd. Edition, Wiley-Blackwell, 2013.
2. Isopescu D. – *Structural design with timber*, Ed Universitatii Tehnice din Iasi, 1994.
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6. Standards, Norms, Specific Technical Regulations (SR EN 1995-1-1-2005, SR EN 338-2004,
7. Andreica H.-A, Berindean A.,Darmon R. – Structuri din lemn, Ed. U.T.PRESS, 2008.

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

Acquired skills will be necessary to the employees working in the consultancy and building design, civil engineers.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
Course	Multiple choice test (theory)	Written test (1 hour exam)	60%
Applications	Solving 2 problems	Written test (1hour exam)	20%
Laboratory works	Test of laboratory works – 5 questions	Presentation	20%
10.4 Minimum standard of performance			
Evaluation components: Theory exam (grade T); Problems (grade P); Project presentation (grade D). Final grade computation formula: N = 0,6T + 0,2P + 0,2G; is calculated only if: L ≥ 5, P ≥ 5 and G ≥ 5.			

Date of filling in
15.09.2017

Teachers in charge of seminars
Senior Lecturer. Ph.D. Eng. MSc.
Ruxandra DÂRMON

Date of approval in the department
15.09.2017

Head of department
Associate Prof. Ph.D. Eng. Claudiu ACIU