



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 Constructions 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 (CE)
1.7	Form of education	Full time
1.8	Subject code	59.20

2. Data about the subject

2.1	Subject name	Agricultural Constructions									
2.2	Subject area	Constructions									
2.3	Course responsible/lecturer	Lecturer Ruxandra Darmon									
2.4	Teachers in charge of seminars	Lecturer Ruxandra Darmon									
2.5	Year of study	IV	2.6	Semester	2	2.7	Assessment	Exam	2.8	Subject category	DID/DOP

3. Estimated total time

3.1	Number of hours per week	6	3.2	of which, course:	2	3.3	applications:	1
3.4	Total hours in the curriculum	52	3.5	of which, course:	28	3.6	applications:	14
Individual study								hours
Manual, lecture material and notes, bibliography								20
Supplementary study in the library, online and in the field								12
Preparation for seminars/laboratory works, homework, reports, portfolios, essays								14
Tutoring								12
Exams and tests								4
Other activities								-
3.7	Total hours of individual study	62						
3.8	Total hours per semester	124						
3.9	Number of credit points	4						

4. Pre-requisites (where appropriate)

4.1	Curriculum	Reinforced and Prestressed Concrete, Steel Constructions
4.2	Competence	

5. Requirements (where appropriate)

5.1	For the course	Amphitheater with blackboard
5.2	For the applications	Classroom with blackboard and computers with structural



	computation software
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6. Specific competences

Professional competences	Theoretical knowledge: To know the normal performance for designing general plans of farm buildings; To know the performance criteria for the design of agricultural buildings; To meet performance requirements standardized construction of livestock; To meet the performance requirements of standardized production plant construction; To know the types of structural systems of livestock buildings; To know the types of structural building systems for vegetable production; To know the specific performance requirements of the enclosure of livestock buildings; After completing the subject, students will be able to: - produce floor plans and cross sections correlated with technologies of livestock buildings and maintenance of bio factors; - determine the type of structure functions properly with the livestock building functionality and technology; - design closure elements correlated with the protection structure and the microclimate; - be calculated in terms of heat engineering closure elements of the building livestock; - able to calculate the energy balance of the building livestock; - prepare a greenhouse design; - decide on measures of corrosion protection of construction elements.
	Presentation of a technical report incorporating the specifically bio-tech elements for agricultural buildings, structural elements and description of the resistance structure. Supporting an oral presentation of the designed construction.
Cross competences	

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

7.1	General objective	Developing abilities to identify, formulate and solve structural engineering problems
7.2	Specific objectives	Developing abilities to design or check structural and specifically members to fulfil strength, stiffness and stability requirements

8. Contents

8.1. Lecture (syllabus)		Teaching methods	Notes
1.	Elements of design theory of agricultural construction: classification, performance criteria, performance targets and specific environmental factors	Lecture with discussions	
2.	The design of general plan of livestock farms correlated with environmental requirements		
3.	Constructions for zootechnical field: performance		



	criteria, indoor and outdoor environmental factors, technologically and specifically functional elements		
4.	Technological and functional elements for housing cattle and swine species		
5.	Technological and functional elements for housing poultry and equine species		
6.	Structural design of housing constructions: construction systems, schemes and static load calculation features, dimensioning the elements of resistance structure		
7.	Structural systems with load-bearing walls		
8.	Structural framing systems with openings 9-15m		
9.	Structural framing systems span 15- 24m		
10.	Hygrothermal design of agricultural buildings: indoor comfort parameters, specific design problems		
11.	The energetically design of the farms buildings. Constructive details of envelope elements.		
12.	Aggressive environments. Corrosion protection. Basics elements to refurbish the agricultural building envelope.		
13.	Functional elements, environmental factors and resistance structures for greenhouses.		
14.	Functional elements, environmental factors and resistance structures for grains storage and fruit warehouse.		
Bibliography Pantel, E., Ioani, A., Popa, A., Nedelcu, M., <i>Strength of Materials. Theory and Problems, Part II</i> , Edit. Napoca Star, 2009. Pantel, E., Ioani, A., Turda., D., Popa A., <i>Lessons of Strength of Materials. Theory and Problems, Part II</i> , Cluj-Napoca, 2004. Gere, J.M, Goodno, B.J., <i>Mechanics of Materials</i> , Eighth edition, Edit. CENGAGE Learning, 2012. Hibbeler, R.C., <i>Mechanics of materials</i> , Eighth edition, Pearson Prentice Hall, 2011. Beer, F. P., Johnston Jr., E.R., DeWolf, J.T., Mazurek, D.F., <i>Mechanics of materials</i> , Sixth edition, McGraw-Hill, 2012. Megson, T.G.H., <i>Structural and stress analysis</i> , Second Edition, Elsevier Butterworth-Heinemann, 2005. da Silva, V. D., <i>Mechanics and strength of materials</i> , Springer-Verlag, 2006. Boresi, A.P., Schmidt, R.J., Sidebottom, O.M., <i>Advanced mechanics of materials</i> , Fifth Edition, John Wiley & Sons, Inc., 1993.			
8.2. Applications/Seminars		Teaching methods	Notes
1.	Study location of farming - livestock and vegetables	Problems solving with	
2.	Designing the floor plan and cross-section for a		



	building within a Farm	discussions	
3.	The study of structural resistance system for a livestock building - structural computation and dimensioning of resistance elements		
4.	The energetically design of the building and envelope elements.		
5.	Study location of farming - livestock and vegetables		
6.	Designing the floor plan and cross-section for a building within a farming - livestock or vegetables		
7.	The energetically design of the building and envelope elements.		
Bibliography Gere, J.M, Goodno, B.J., <i>Mechanics of Materials</i> , Eighth edition, Edit. CENGAGE Learning, 2012. Pantel, E., Ioani, A., Popa, A., Nedelcu, M., <i>Strength of Materials. Theory and Problems, Part II</i> , Edit. Napoca Star, 2009. Pantel, E., Ioani, A., Turda., D., Popa A., <i>Lessons of Strength of Materials. Theory and Problems, Part II</i> , Cluj-Napoca, 2004. Hibbeler, R.C., <i>Mechanics of materials</i> , Eighth edition, Pearson Prentice Hall, 2011. Beer, F. P., Johnston Jr., E.R., DeWolf, J.T., Mazurek, D.F., <i>Mechanics of materials</i> , Sixth edition, McGraw-Hill, 2012. Ye, J., <i>Structural and stress analysis. Theories, tutorials and examples</i> , Taylor & Francis, 2008. Hartsuijker, C., Welleman, J.W., <i>Engineering mechanics. Volume 2: Stresses, Strains, Displacements</i> , Springer, 2007.			

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

Acquired skills will be needed for civil engineers who work in design and buildings firms, and are fundamental for those who will follow master and doctoral programmes in the field of Civil Engineering.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
Course	2 theory subjects	Oral examination	70%
Applications	3 questions from the design of the agricultural building studied	Written examination	30%
10.4 Minimum standard of performance To written examination is eliminatory. The minimum mark required to pass the written examination is 5 (five). The minimum average mark of the two theory subjects is 5 (five). Attendance at laboratory works, solving and submitting the design of one agricultural building is mandatory under the provisions of ECTS Regulation.			



TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA

Date of
completion
september 2016

Course Tenure

Lecturer ,
Dr Eng_MSc Ruxandra Dârmon

Course Instructor

Lecturer,
Dr Eng_MSc Ruxandra Dârmon

Date of approval within department
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Department Manager
Senior Lecturer,
Dr Eng_Claudiu Aciu