



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 Constructions
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/ Engineer
1.7	Form of education	Full time
1.8	Subject code	45.20

2. Data about the subject

2.1	Subject name	Fire Safety of Constructions									
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	-									
2.5	Year of study	III	2.6	Semester	2	2.7	Assessment	C	2.8	Subject category	DS/DOB

3. Estimated total time

3.1	Number of hours per week	2	3.2	of which, course:	2	3.3	applications:	-
3.4	Total hours in the curriculum	78	3.5	of which, course:	28	3.6	applications:	-
Individual study								hours
Manual, lecture material and notes, bibliography								28
Supplementary study in the library, online and in the field								18
Preparation for seminars/laboratory works, homework, reports, portfolios, essays								-
Tutoring								2
Exams and tests								2
Other activities								
3.7	Total hours of individual study			50				
3.8	Total hours per semester			78				
3.9	Number of credit points			3				

4. Pre-requisites (where appropriate)

4.1	Curriculum	Resistance of Materials, Fluid Dynamics, Thermodynamics, Chemistry, Numerical methods and Statistics
4.2	Competence	Fire safety Engineering

5. Requirements (where appropriate)

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



6. Specific competences

Professional competences	<p>After completing the discipline, students must have theoretical knowledge about :</p> <ul style="list-style-type: none"> • Constructive and functional conformation of buildings concerning fire safety. • Demonstrate an understanding of the processes of Fire Growth and fire modelling - Ignition: ignition of solid, liquids and gases • Evaluation of specific fire actions on buildings structure. • Fire design of structural elements for steel, timber and reinforced concrete structures. • Fire protection of structural elements for steel, timber and reinforced concrete structures.
Cross competences	The student should be able to apply the prescriptive requirements of P118-99 in order to elaborate a fire scenario.

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

7.1	General objective	<p>Constructive and functional conformation of buildings concerning fire safety.</p> <p>Qualitative evaluation of constructions fire behavior</p>
7.2	Specific objectives	<p>Evaluation of specific fire actions on buildings structure.</p> <p>Fire design of structural elements for steel, timber and reinforced concrete structures.</p> <p>Fire protection of structural elements for steel, timber and reinforced concrete structures.</p>

8. Contents

8.1. Lecture (syllabus)		Teaching methods	Notes
1.	Introduction in fire behavior of buildings and construction elements. Natural and normalized fire. Factors which influence development and destructiv potential of fire.	Power Point presentation	Video – projector
2.	Thermal load. Parametric fire curves. Standard fire curve.		
3.	Requirements and performance criteria in buildings fire design. Fire behaviour and fire resistance tests.		
4.	Review of romanian regulations of fire protection. fire safety according standard P118-1999.		
5.	Fire scenario		
6.	Fire design of constructions according to performance criteria. regulations based on performance criteria.		
7.	Eurocodes Parts 1-2. Fire safety design		
8.	Thermal load evaluation. Eurocode 1991-1-2. Parametric fire curves.		
9.	Enclosure Fire dynamics. Plume equations.		
10.	Fuel controlled and ventilation controlled compartment fire. Flashover criteria.		



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11.	Fire design of constructions according to their performance criteria. regulations based on performance criteria.		
12.	Smoke filling time.		
13.	Fire protection of buildings elements. Protection of steel elements. Protection of wood elements. Protection of concrete elements.		
14.	Fire design and fire structural analysis.. Steel elements and structures design. Timber structural elements and structures design. Concrete structural elements and structures design.		
Bibliography			
<ol style="list-style-type: none"> 1. Romanian Fire Safety Requirements: P118-99. 2. EUROCODES 1-5 Parts 1-2. 3. Standards, norms, national and international technical regulations. 4. Bjorn Karlsson, James Quintiere. Enclosure Fire Dynamics. Wiley & sons, 2009. 5. Dougal Drysdale – Fire Dynamics, Wiley & sons, 2012. 			
8.2. Applications/Seminars		Teaching methods	Notes
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Bibliography			

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 who work in structural design, civil engineers as well as a starting point for secondary education in fire safety engineering.



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10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
Course	Examination of theoretical part	Written exam paper	100%
Applications	-		
10.4 Minimum standard of performance: grade 5/10.			

Date:

Course Tenure

Course Instructor

september 2017

Lecturer ,
Dr Eng_MSc Ruxandra Dârmon

Senior Lecturer,
Dr Eng_MSc Ruxandra Dârmon

Date of approval within department

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Department Manager
Associate professor,
Dr Eng_Claudiu Aciu