



SYLLABUS

1. Data about the program of study

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|-----|--------------------------------|---|
| 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 | CE |
| 1.7 | Form of education | Full time |
| 1.8 | Subject code | 45.20 |

2. Data about the subject

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|-----|--------------------------------|-----|------------------------------|---|----------------|---|----------------------|---------|
| 2.1 | Subject name | | Fire Safety of Constructions | | | | | |
| 2.2 | Subject area | | | | | | | |
| 2.3 | Course responsible/lecturer | | | | | | | |
| 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 | DID/DOP |

3. Estimated total time

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|--|---------------------------------|----|-----------------------|----|-------------------|-------|
| 3.1 | Number of hours per week | 2 | 3.2 of which, course: | 28 | 3.3 applications: | |
| 3.4 | Total hours in the curriculum | 52 | 3.5 of which, course: | 28 | 3.6 applications: | |
| Individual study | | | | | | hours |
| Manual, lecture material and notes, bibliography | | | | | | 12 |
| Supplementary study in the library, online and in the field | | | | | | 2 |
| Preparation for seminars/laboratory works, homework, reports, portfolios, essays | | | | | | 8 |
| Tutoring | | | | | | |
| Exams and tests | | | | | | 2 |
| Other activities | | | | | | |
| 3.7 | Total hours of individual study | 24 | | | | |
| 3.8 | Total hours per semester | 52 | | | | |
| 3.9 | Number of credit points | 2 | | | | |

4. Pre-requisites (where appropriate)

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

5. Requirements (where appropriate)



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

6. Specific competences

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| Professional competences | Constructive and functional conformation of buildings concerning fire safety. 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 | |

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

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| 7.1 | General objective | Constructive and functional conformation of buildings concerning fire safety. Qualitative evaluation of constructions fire behavior |
| 7.2 | Specific objectives | 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. |

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 distructiv potential of fire. | | |
| 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 | | |



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|--|--|-------------------------|--------------|
| 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. | | |
| 11. | Fire design of constructions according to 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 structural analysis, strength calculation and stability computation. Steel elements and structures design. Wood elements and structures design. Concrete elements and structures design. | | |
| Bibliography <ol style="list-style-type: none"> 1. Normativul P118-99. 2. Andreica, H.-A. – <i>CONSTRUCȚII</i>, UT PRES Cluj-Napoca 3. EUROCODE 1-5 Parts 1-2. 4. Standards, norms, national and international technical regulations. 5. Quintiere J. Enclosure Fire Dynamics. | | | |
| 8.2. Applications/Seminars | | Teaching methods | Notes |
| 1. | | | |
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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

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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 | | | |
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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