

# Studijní plán

## Název plánu: Sustainable Constructions under Natural Hazards and Catastrophic Events

Sou část VUT (fakulta/ústav/další): Fakulta stavební

Katedra:

Obor studia, garantovaný katedrou: Úvodní stránka

Garant oboru studia.:

Program studia: Civil Engineering

Typ studia: Navazující magisterské prezenční

Předepsané kredity: 90

Kredity z volitelných předmětů: 0

Kredity v rámci plánu celkem: 90

Poznámka k plánu: International programme, which is realized by an international consortium of universities.

Applications for study are accepted and processed exclusively through the consortium secretariat.

Název bloku: Povinné předměty

Minimální počet kreditů bloku: 70

Role bloku: Z

Kód skupiny: MA\_SUSCOS\_1P

Název skupiny: SUSCOS, 1st semester, compulsory subjects

Podmínka kredity skupiny: V této skupině musíte získat 20 kreditů

Podmínka předmětů skupiny: V této skupině musíte absolvovat alespoň 4 předměty

Kredity skupiny: 20

Poznámka ke skupině:

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kód jejích členů) Využívající, autoři a garanti (gar.)	Zakonění	Kredity	Rozsah	Semestr	Role
1341C01	1C1 Design of Sustainable Constructions	Z,ZK	6	2P+2C	1	z
1341C02	1C2 Conceptual Design of Buildings	Z,ZK	6	2P+2C	1	z
1341C03	1C3 Conceptual Design of Bridges	Z,ZK	6	2P+2C	1	z
1341C04	1C4 Local Culture and Language	Z	2	2P+2C	1	z

Charakteristiky předmětů této skupiny studijního plánu: Kód=MA\_SUSCOS\_1P Název=SUSCOS, 1st semester, compulsory subjects

1341C01	1C1 Design of Sustainable Constructions	Z,ZK	6
1341C02	1C2 Conceptual Design of Buildings	Z,ZK	6
1341C03	1C3 Conceptual Design of Bridges	Z,ZK	6
1341C04	1C4 Local Culture and Language	Z	2

Kód skupiny: MA\_SUSCOS\_2P

Název skupiny: SUSCOS, 2nd semester, compulsory subjects

Podmínka kredity skupiny: V této skupině musíte získat 20 kreditů

Podmínka předmětů skupiny: V této skupině musíte absolvovat alespoň 4 předměty

Kredity skupiny: 20

Poznámka ke skupině:

Kód	Název předmětu / Název skupiny předmětů (u skupiny předmětů seznam kód jejích členů) Využívající, autoři a garanti (gar.)	Zakonění	Kredity	Rozsah	Semestr	Role
1262C11	2C11 Business Economics and Entrepreneurship	Z,ZK	2	2P+2C	2	z
1322C09	2C9 Design for Seismic and Climate changes	Z,ZK	6	2P+2C	2	z
1342C08	2C8 Advanced Design of Steel and composite structures	Z,ZK	6	2P+2C	2	z
1342C10	2C10 Design for Fire and Robustness	Z,ZK	6	2P+2C	2	z

Charakteristiky předmětů této skupiny studijního plánu: Kód=MA\_SUSCOS\_2P Název=SUSCOS, 2nd semester, compulsory subjects

1262C11	2C11 Business Economics and Entrepreneurship	Z,ZK	2
1322C09	2C9 Design for Seismic and Climate changes	Z,ZK	6

1342C08	2C8 Advanced Design of Steel and composite structures	Z,ZK	6
1342C10	2C10 Design for Fire and Robustness	Z,ZK	6

The aim of this course is to give students an understanding of the design methods of structures at accidental situations, fire and explosion. The course is focussed on all design methods involved in fire design: prediction of fire scenario, evaluation of fire load, calculation of gas temperatures in the fire compartment and structural analysis. Special attention is paid to fire modelling when several design models is presented including nominal temperature curves, simple models and advanced models. Gas temperature in the fire compartment is considered as basis for the structural design. Methods for prediction of temperature of the structural elements are presented and mechanical properties of structural materials (steel, concrete, timber and aluminium structures) are presented. Design models for steel, concrete, steel concrete composite, timber and aluminium structural elements loaded by tension, compression and bending moment are presented. Attention is paid to protection of steel and timber structures to fire, various methods of protection are described. Smaller part of the course is focussed on explosions. Types of explosions are described together with design models. Basic principles of structural analysis are presented. Design methods are explained with focus to increase robustness of the structure. The theoretical part is supplemented with practical exercises using simple design models with aim to apply the knowledge in design of simple structural elements. Understanding of basic principles of structural analysis and design of steel, concrete and timber structures is necessary.

Kód skupiny: MA\_SUSCOS\_3P

Název skupiny: SUSCOS, 3rd semester, diploma project

Podmínka kredity skupiny: V této skupině musíte získat 30 kredit

Podmínka p edm ty skupiny: V této skupině musíte absolvovat alespo 1 p edm t

Kredity skupiny: 30

Poznámka ke skupině:

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len ) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
1343C12	3C12 Theses	Z	30	24C	3	z

Charakteristiky p edmet této skupiny studijního plánu: Kód=MA\_SUSCOS\_3P Název=SUSCOS, 3rd semester, diploma project

1343C12	3C12 Theses	Z	30
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Final project for Erasmus mundus master course SUSCOS.

Název bloku: Povinn volitelné p edm ty

Minimální po et kredit bloku: 20

Role bloku: S

Kód skupiny: MA\_SUSCOS\_1V

Název skupiny: SUSCOS, 1st semester, facultative subjects

Podmínka kredity skupiny: V této skupině musíte získat 10 kredit

Podmínka p edm ty skupiny: V této skupině musíte absolvovat alespo 2 p edm ty

Kredity skupiny: 10

Poznámka ke skupině:

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len ) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
1341E05	1E5 Advanced Design of Glass Structures	Z,ZK	5	2P+2C	1	s
1341E07	1E7 Rehabilitation and Maintenance of Structures	Z,ZK	5	2P+2C	1	s
1342E12	2E12 Design for Renewable Energy Systems	Z,ZK	5	2P+2C	1	s

Charakteristiky p edmet této skupiny studijního plánu: Kód=MA\_SUSCOS\_1V Název=SUSCOS, 1st semester, facultative subjects

1341E05	1E5 Advanced Design of Glass Structures	Z,ZK	5
1341E07	1E7 Rehabilitation and Maintenance of Structures	Z,ZK	5
1342E12	2E12 Design for Renewable Energy Systems	Z,ZK	5

Kód skupiny: MA\_SUSCOS\_2V

Název skupiny: SUSCOS, 2nd semester, facultative subjects

Podmínka kredity skupiny: V této skupině musíte získat 10 kredit

Podmínka p edm ty skupiny: V této skupině musíte absolvovat alespo 2 p edm ty

Kredity skupiny: 10

Poznámka ke skupině:

Kód	Název p edm tu / Název skupiny p edm t (u skupiny p edm t seznam kód jejích len ) Vyu ující, auto i a garanti (gar.)	Zakon ení	Kredity	Rozsah	Semestr	Role
1332E13	2E13 Advanced Design of Concrete structures	Z,ZK	5	2P+2C	2	s
1341E06	1E6 Advanced Design of Timber structures	Z,ZK	5	2P+2C	2	s

1342E14	2E14 Design of Aluminium and Stainless steel structures	Z,ZK	5	2P+2C	2	s
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**Charakteristiky p edmet této skupiny studijního plánu: Kód=MA SUSCOS 2V Název=SUSCOS, 2nd semester, facultative subjects**

1332E13	2E13 Advanced Design of Concrete structures	Z,ZK	5
1341E06	1E6 Advanced Design of Timber structures	Z,ZK	5
1342E14	2E14 Design of Aluminium and Stainless steel structures	Z,ZK	5

The course will supply students with basic information on material bases, behaviour and design of load bearing civil engineering structures from aluminium alloys and stainless steels. Expansion of structures made of aluminium alloys and stainless steels during last decades will be demonstrated and advantages perchanace drawbacks of using these materials will be discussed. The first part of the course will be devoted to structures from aluminium alloys. Selection of suitable materials for given structure, material properties and application examples will be provided. Subsequently primary information on design in accordance with Eurocode 9 (Design of aluminium structures) will supply students with view concerning differences with respect to design of steel structures. Heat affected zone softening (HAZ) will be shown and corresponding effect on design. The course will cover design from the view of both ultimate and serviceability limit states, including design of various types of connections. Finally advanced models beyond elastic limit will be demonstrated and further possibilities of design using educational programme TALAT and others will be provided. The second part of the course will be devoted to structures from stainless steels. Trends in design using stainless steels and recent notable structures will be discussed. Again a survey of general stainless steel materials and those suitable for civil engineering structures will be provided. The information on design will follow Eurocode 3 (General rules - Supplementary rules for stainless steels) and recommendations of Euro Inox. The course will cover design from the view of both ultimate and serviceability limit states, including design of various types of connections. Special attention will be given to erection and installation of stainless steel structures in respect to need of specific treatment, handling and storage of stainless steel elements and structures.

### Seznam p edm t tohoto pr chodu:

Kód	Název p edm tu	Zakon ení	Kredity
1262C11	2C11 Business Economics and Entrepreneurship	Z,ZK	2
1322C09	2C9 Design for Seismic and Climate changes	Z,ZK	6
1332E13	2E13 Advanced Design of Concrete structures	Z,ZK	5
1341C01	1C1 Design of Sustainable Constructions	Z,ZK	6
1341C02	1C2 Conceptual Design of Buildings	Z,ZK	6
1341C03	1C3 Conceptual Design of Bridges	Z,ZK	6
1341C04	1C4 Local Culture and Language	Z	2
1341E05	1E5 Advanced Design of Glass Structures	Z,ZK	5
1341E06	1E6 Advanced Design of Timber structures	Z,ZK	5
1341E07	1E7 Rehabilitation and Maintenance of Structures	Z,ZK	5
1342C08	2C8 Advanced Design of Steel and composite structures	Z,ZK	6
1342C10	2C10 Design for Fire and Robustness	Z,ZK	6
The aim of this course is to give students an understanding of the design methods of structures at accidental situations, fire and explosion. The course is focussed on all design methods involved in fire design: prediction of fire scenario, evaluation of fire load, calculation of gas temperatures in the fire compartment and structural analysis. Special attention is paid to fire modelling when several design models is presented including nominal temperature curves, simple models and advanced models. Gas temperature in the fire compartment is considered as basis for the structural design. Methods for prediction of temperature of the structural elements are presented and mechanical properties of structural materials (steel, concrete, timber and aluminium structures) are presented. Design models for steel, concrete, steel concrete composite, timber and aluminium structural elements loaded by tension, compression and bending moment are presented. Attention is paid to protection of steel and timber structures to fire, various methods of protection are described. Smaller part of the course is focussed on explosions. Types of explosions are described together with design models. Basic principles of structural analysis are presented. Design methods are explained with focus to increase robustness of the structure. The theoretical part is supplemented with practical exercises using simple design models with aim to apply the knowledge in design of simple structural elements. Understanding of basic principles of structural analysis and design of steel, concrete and timber structures is necessary.			
1342E12	2E12 Design for Renewable Energy Systems	Z,ZK	5
1342E14	2E14 Design of Aluminium and Stainless steel structures	Z,ZK	5
The course will supply students with basic information on material bases, behaviour and design of load bearing civil engineering structures from aluminium alloys and stainless steels. Expansion of structures made of aluminium alloys and stainless steels during last decades will be demonstrated and advantages perchanace drawbacks of using these materials will be discussed. The first part of the course will be devoted to structures from aluminium alloys. Selection of suitable materials for given structure, material properties and application examples will be provided. Subsequently primary information on design in accordance with Eurocode 9 (Design of aluminium structures) will supply students with view concerning differences with respect to design of steel structures. Heat affected zone softening (HAZ) will be shown and corresponding effect on design. The course will cover design from the view of both ultimate and serviceability limit states, including design of various types of connections. Finally advanced models beyond elastic limit will be demonstrated and further possibilities of design using educational programme TALAT and others will be provided. The second part of the course will be devoted to structures from stainless steels. Trends in design using stainless steels and recent notable structures will be discussed. Again a survey of general stainless steel materials and those suitable for civil engineering structures will be provided. The information on design will follow Eurocode 3 (General rules - Supplementary rules for stainless steels) and recommendations of Euro Inox. The course will cover design from the view of both ultimate and serviceability limit states, including design of various types of connections. Special attention will be given to erection and installation of stainless steel structures in respect to need of specific treatment, handling and storage of stainless steel elements and structures.			
1343C12	3C12 Theses Final project for Erasmus mundus master course SUSCOS.	Z	30

Aktualizace výše uvedených informací naleznete na adrese <http://bilakniha.cvut.cz/cs/FF.html>

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