International Programme

List of courses taught in English

Building Construction

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Fall semester

VŠTE
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Building Construction

Course code	Course title	Number of ECTS credits
S_POS_1	Building Construction I	6
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Building Construction I (Code: S_POS_1) | Number of credits: 6

Course objectives

The aim is to obtain professional knowledge of foundations, substructure, vertical supporting structures, chimneys, expansion and construction systems. After successful completion of the course the student: a) knows to determinate a module coordination and to determine and define the structural systems of multi-storey buildings (structural wall system, skeleton, and combined), structural systems of hall buildings (construction systems stressed primarily in bending, compression mostly, mostly drawn) and the superstructure. b) knows the principles of dilated and non-bearing structures, and s/he can suggest expansion in terms of differential subsidence and volume changes. c) is able to describe the type of shallow and deep foundations and explain the underlying load distribution in the soil and its effect on settlement construction. d) is able to resolve the skeleton and massive bottom structure, lighting, underground construction, insulation and construction of underground structures without a basement. e) can apply the knowledge of the vertical supporting structures (technological point of view, design of structural walls and columns, openings in bearing walls). f) is able to characterize the types of chimneys, assess the impact of location on the stack is functioning correctly. Students can also evaluate the chimneys of the physical and chemical point of view and to propose a reconstruction or repair of the chimney.

Topics

1. Structural Systems I - multi-storey buildings
2. Structural Systems II - Indoor buildings
3. Dilation of buildings
4. Excavation and earthworks
5. Foundations I
6. Foundations II
7. Foundations III
8. Substructures
9. Vertical load-bearing structures I

10. Vertical load-bearing structures II

11. Vertical load-bearing structures III

12. Vertical load-bearing structures IV

13. Chimneys

Informatics I (Code: S_INF_1) | Number of credits: 6

Course objectives

The aim of the course is gaining and complementing of the knowledge and practical skills in using personal computers in the range of the ECDL modules M1, M7, M3, M4 and partly AM3 and AM4. After the successful completion of the course, the student will be able to understand the concepts related to ICT, to use the Internet and its main services and work effectively with selected MS Office applications when creating and editing text and spreadsheet documents. These skills can be used for creating seminar and bachelor's works.

Topics

1. - 2. Adding of the knowledge to the level of ECDL Module M1 (basic concepts of information and communication technology) - hardware (basic terms and parameters), software (breakdown, licenses), computer networks (types, data transfer), use of ICT (basic concepts, communication, community), security (identity, data security, computer viruses), law (copyright, privacy policy)

3. - 4. Adding of the knowledge to the level of ECDL Module M7 (Internet and Communication) - Internet (basic concepts, security, browser settings), searching, saving and printing files, electronic communication (e-mail and other forms, security)

5. - 6. The full ECDL module M3 (Word Processing) - Work with documents, creating a document, formatting text, working with objects, mail merge, printing

7. - 8. The reduced ECDL Module AM3 (Advanced word processing) - an advanced text formatting, links, indexes, fields, collaboration tools, partitions, security and document settings

9. - 10. The full ECDL module M4 (Spreadsheet) - work with tables (create, edit, manage), cells (insert, select, edit, copy, format), lists, formulas and functions (basic use), graphs (creation and editing), prints

11. - 13. The reduced ECDL Module AM4 (Advanced work with spreadsheet) - Advanced formatting, advanced formulas and functions, data analysis (pivot tables, sorting, filtering), data checking (validation, monitoring), import and export of data, links, collaboration tools, security

History of Architecture (Code: S_DAR) | Number of credits: 6

Course objectives

After completing the course, the student will be able to understand the history of architecture, especially in view of the relation of structure, spatial and architectural design in various stages of history. Architecture development is presented in the major concrete structures. The course also includes a summary of the prominent representatives of various periods and styles in the Czech Republic, with particular reference to the fund of South Bohemia. Based on acquired knowledge, students will be able to understand the value structure of historic buildings with which they will encounter in practice and to include these buildings in a development context. Course should initiate a dialogue between architecture, urbanism and art. Students will learn the basic procedures for analyzing individual buildings in terms of its development and context.

Topics

1. Concepts, categories, the beginnings of architecture

2. Antiquity

3. Greek, Etruscan and Hellenistic architecture

4. Roman and Byzantine architecture

5. Pre-Romanesque and Romanesque architecture

6. Gothic architecture

7. Renaissance architecture

8. Baroque architecture

9. Classicism

10. Romanticism, Art Nouveau 11. Modern architecture

12. Functionalism, neoclassicism 13. Postmodern and current trends

Modern Architecture (Code: S_SAD) | Number of credits: 6

Initiation of dialogue between contemporary architecture, urbanism and art focusing on Czech architectural scene. After completion of the course students will be able to understand the principles of modern architectural design, and know the environmental friendly architecture+ new approaches in modern architecture. Discursus will present foundational debates about social and technological aspects of modern architecture and the continuation of those debates into contemporary architecture.

Literature:

- CIAM 1933 The Athens Charter
- Ch. Alexander, S. Ishikawa, M. Silverstein. A Pattern Language: Towns,Buildings, Construction
- Christopher Alexander. Notes on the synthesis of form
- Kevin Lynch. The Image of the City , A Theory of Good City Form
- Christian Norberg-Schulz. Genius loci
- Jan Gehl. Life Between Buildings
- Jan Gehl, Lars Gemzoe. New City Spaces
- Aldo Rossi. The architecture of the City
- Rem Koolhaas. Delirious New York
- Manuel de Solà-Morales. A Matter of Things

Mathematics I (Code: S_MAT_1) | Number of credits: 6

Course objectives

The aim of this course is to provide the students with the basic knowledge of algebra, differential and integral calculus of functions of one variable needed in the study of specialized subjects. Then the aim is also to provide and clarify the main methods and algorithms. After the successful completing of the course, the student solves basic tasks of the course (counting with vectors, matrices and determinants, solving systems of linear equations, properties and graphs of elementary functions, calculation of limits and function derivation, investigating of function process, counting of primitive functions, indefinite integral, the direct method, per-partes, substitution method, calculation of definite integrals and content of a plane figure) individually.

Topics

1. Vector, vector space, equality of vectors, counting with the vectors, linear combinations of vectors, linear dependence and independence of vectors, basis and dimension of vector space, scalar product of vectors

2. Matrices, rank of matrices, matrix addition and multiplication, inverse matrix, Frobenius theorem, solving systems of linear equations using Gaussian method

3. Determinants, Cramer's rule

4. Functions of one real variable, domain and field of functional values, basic algebraic functions and non-algebraic

5. Inverse functions, even and odd functions, inverse trigonometric functions

6. Limit of function

7. Derivative function, basic rules for derivate, derivative compound function, function graph tangent

8. L'Hospital's rule. The importance of first and second derivative for the function course (increasing, decreasing, convex, concave, local extrema and inflection points)

9. The primitive function, indefinite integral, direct integration

10. The method of integration by-partes

11. Substitution method

12. Definite integral

13. Calculation of a plane figure

Mathematics II (Code: S_MAT_2) | Number of credits: 6

Course objectives

The aim of the course is to complement and complete the knowledge of the integral calculus of functions of one variable, including applications for the calculations of content of areas, volumes of rotating solids and length of curves. The aim is also understanding and practical ability to solve ordinary differential equations of first order and some special types of equations of higher orders. After the successful completion of the course, the student is able to: individually solve integral roles; solve differential equations, analyze and propose a procedure of solving of practical problems related to the problem of integral calculus.

Topics

1. Some more complicated indefinite integrals

2. Decomposition of rational functions into partial fractions

3. Integration of rational functions

4. Special substitutions

5. Calculation differential equations of the first order, separation of variables

6. Homogeneous and first order linear equations

8. Variation of parameters, integrating factor method

9. Bernoulli´s differential equation

10. Simple differential equations of the second order

11. Variation of parameters for higher order equation

12. Linear differential equations with constant coefficients

13. Linear differential equations with special right side

Metal and Wooden Structures (Code: S_KDK) | Number of credits: 6

Course objectives

The aim is to present design of wooden and metal elements of structures according to European technical standards including the development of drawings. After successful completion of the course students know design principles of steel and timber structures, they can design and evaluate the elements of the basic types of stress (tension, compression, bending and shear), including its combinations. They can establish deformation of element, know the other aspects of design and usability of construction and connecting elements, including computational models and they are able to design basic types of wood joints and steel structures.

Topics

1.Introduction to the design of steel structures, steel properties

2. Overview of limit state standards for designing steel structures

3. Designing the steel structures according to the limit state 1 groups - tension, compression

4. Designing the steel structures according to the limit state 1 groups - bending, shear, torsion

5. Designing the steel structures according to the limit state 1 group - a combination of stress

6. Designing the steel structures according to the limit state 2 groups - deformation and vibration of construction elements 7. Connections of steel structures

8. Introduction to the design of timber structures

9. Properties of wood

10. Overview and limit state standards for designing wooden constructions

11. Design elements of timber structures according to the limit state 1 groups - tension, compression, bending

12. Design elements of timber structures according to the limit state 1 groups - shear, torsion, stress combinations

13. Design elements of timber structures according to the limit state 2 groups – deformation and vibration of construction elements and connections of timber structures

Physics (Code: S_FYS) | Number of credits: 6

Course objectives

This course is aimed at mastering the theoretical basis of the classical physics. Graduates can describe physical phenomena and use the gained knowledge in the study of technical subjects.

After successfully passing the course, the student is able

- to describe and explain the classical physics phenomena
- to identify and understand the practical problems
- to suggest and find appropriate solution to a problem by applying the theory
- to discuss the solution and try to find a class of solutions (if that exists)
- to make conclusions and generalization and apply the gained knowledge to analogous situations in technical fields

Topics

1. Space and time
2. Kinematics of a material point
3. Dynamics of a material point
4. Work, power, energy
5. Gravitational field
6. System of particles and rigid solid
7. Rigid body dynamics
8. Oscillations, waves
9. Acoustics
10. Hydromechanics
11. Thermodynamics
12. Kinetic theory of matter
13. Optics

Soil Mechanics and Building Foundation (Code: S_MZS) | Number of credits: 6

Course objectives

Aim of tuition of this subject is to explain basics of Geology, Advanced Geology and Soil mechanics.

Topics

1. Basics of geology, geoological structure of the Earth

2. Basics components of Earth's crust, minerals and rocks

3. Endogenous processes geological structures, board tectonics

4. Exogenous processes

5. Tasks of Engineering geology, and its importance for practice

6. Hydrogeology

7. Regional geology

8. Origin and compound of rocks, water in soil

9. Mechanical characteristics of rock and soil

10. Classification systems of soil, granularity curve

11. Tension and deformations in soil, areal and depth grounds

12. Earthy forces

13. Hillside stability

Static Solution of Constructions (Code: S_SRK) | Number of credits: 6

Course objectives

The aim is to familiarize students with the general principles, principles and methods of static – structural solutions supporting the construction of multi-storey buildings and hall construction, with emphasis on their layout and vertical layout loads, static systems , static analysis , design and evaluation of each beam , node, and the whole structure , with view of the critical limit states and ultimate and applicable technical standards .

Topics

1. Storey building

2. Proposal structural system

3. Special construction systems

4. The ceiling structure

5. Columns

6. The vertical stiffeners

7. Halls layout

8. Load halls

9. Territorial rigidity hall

10. Roof structures 11. Cross links

12. Pillars 13. Longitudinal vertical bracing building and perimeter wall

Technical Building Equipment I (Code: S_TZB_1) | Number of credits: 6

Course objectives

The aim is to present basic knowledge of building technical services and appliances in the area of water supply, waste water and gas distribution. After successful completion of the course students can apply knowledge of termilogy, technology in developing the project sewage, water and gas. The student is able to design these systems by using knowledge of water supply, waste water and gas facilities.

Topics

1. Engineering nets - indoor technical services.
2. Technical Equipment - typology and fittings.
3. Necessity of water supply water objects, water connection.
4. The internal water supply, water supply fire.
5. Calculation of internal water mains.
6. Hot water - parameters, tank heating, heat flow.
7. Waste water outside drains, sewer connections.
8. The internal drains, underground drainage, sewer fittings, overdraft effluent drainage of paved surfaces.
9. Protection of sewage from unwanted substances.
10. Design of sewer pipes, wastewater disposal

Typology of Residential and Civic Buildings (Code: S_TBO) | Number of credits: 6

Course objectives

The scope is developing an understanding of a range of technical, theoretical and professional issues and the ability to integrate this understanding into design proposals. The student will be able to evaluate, what are the qualities and what are the problems of built environment in different scales (from family house to the urban blocks).

Typology is the taxonomic classification of (usually physical) characteristics commonly found in buildings and urban places, according to their association with different categories, such as intensity of development (from natural or rural to highly urban), degrees of formality, and school of thought (for example, modernist or traditional). Individual characteristics form patterns. Patterns relate elements hierarchically across physical scales (from small details to large systems). We will discuss all the typological cases and analyse them (typological research). The norms and rules of designing should follow the thesis of St. Augustin of Hippo: "unity in necessary things; liberty in doubtful things; charity in all things".

Topics

1. Opening to typology in building architecture.
2. Aspects of living.
3. Definition of apartment and its fragments.
4. Apartment zones, standards.
5. Historical development of the family houses
6. Family house- typological species
7. Historical development of the appartment buildings
8. Typology of the appartment building, indoor and outdoor spaces

9. Typological species of appartment buildings

10. Polyfunctional buildings

11. Social buildings, panel residential complexes

12. Barrier-free buildings

13. Housing of seniors