International Programme

List of courses taught in English

Building Construction

Academic Year 2019 – 2020

Summer semester

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Building Constructions

Course code	Course title	Number of ECTS credits
IDW	Introduction Week	6
S_INF_1	Informatics I	6
S_DAR	Architectural History	6
S_SMC_1	Construction Mechanics I	6
S_POS_1	Building Construction I	6
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Course descriptions

Logistics Technologies

IDW Introduction Week | Number of credits: 6

International Programme starts with the Introduction Week. This week is organised for all international students. It is meant as a first introduction to the Czech language and Czech culture. The week will give a possibility for socialising with international and local students.

The output is a presentation and short essay on a given topic. Detailed requirements are to be specified at the beginning of the Week.

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

Architectural History (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

Literature: • CIAM 1933 The Athens Charter • Ch. Alexander, S. Ishikawa, M. Silverstein. A Pattern Language: Towns,Buildings, Construction • Christopher Alexander. Notes on the sythesis of form • Kevin Lynch. The Image of the City • Kevin Lynch. 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

Construction Mechanics I (Code: S_SMC_1) | Number of credits: 6

Course objectives

Students will be familiarized with types of structures load, and their application. They will learn the issues of the dynamic behaviour of structures. After successful completion of the course the students are able to: - calculate the cross section centre of gravity and determine the ellipse of inertia; to determine degrees of width and the static structure certainty – to determine the reactions of beams and compute their sizes – to calculate the axial forces in the rods of a statically determinate truss – to determine the internal forces in statically determinate full beams (console, a simple beam, oblique beam, refracted beam, slab and wall) – to determine the action of certain complex statically determinate structures (triple articulation arch, Gerber beam) – to explain the behaviour of statically indeterminate structures and gain theoretical knowledge of the ways of their calculation. Based on the information and skills they will be able to decide on the choice of supporting structure.

Topics

1. Physical quantities, scalars, vectors, physical dimension, force as a vector, beam forces in the plane, composition of forces

2. Torque to point axis, static torque of two forces. The general spatial system of forces, the resulting effect, balance, equity

3. Degrees of width of a particle, board, bodies, systems, static determination

4. Continuous load, concentrated force, concentrated torque and continuous torque load

5. Supporting and reaction of a particle, boards and bodies, noncorect cases of supporting

6. Loads of building structures

7. Truss structures, methods of calculation

8. Simple beam and console, types of loads, calculation of reactions, internal forces.

9. Refracted beam, internal forces

10. Kinematic method of calculating the reactions of complex systems

11. The centre of gravity of a cross-section and moments of inertia

12. Fundamentals of dynamics of structures

13. Principles of solving statically indeterminate structures

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

Building Materials (Code: S_SHM) | Number of credits: 6

Course objectives

After successful completion of the course, students will gain a basic overview of the structure and basic properties of building materials and their use as building materials. During practicing in laboratories they will carry out selected laboratory tests, and learn about the possibilities of laboratory tests.

Topics

1. Stone; ceramic
2. Mortar; concrete; lightweight concrete; plastic concrete; plaster
3. Concrete; lightweight concrete; plastic concrete
4. Wood
5. Glass
6. Steel
7. Plastics
8. Hydro-insulation materials
9. Thermal, acoustic and fire protection insulation
10. Thermal, acoustic and fire protection insulation
11. Floor coverings
12. Materials for partition structures
13. Dressing materials - sealants, gaskets

Sustainable Building Construction (Code: S_N_UVB) | Number of credits: 6

Course objectives

The aim of the course Sustainable Construction of Buildings is to introduce students with sustainable construction. Fundamental principles and objectives of sustainable development are formulated in the document Agenda 21. The course deals mainly with environmental and energy aspects of building and possibilities of recycled materials in building construction. Students are introduced to methodology of multi-criteria evaluation of buildings (SBToolCZ).

The aim of the exercise is to obtain basic knowledge and an overview of the complex evaluation of the quality of buildings in terms of criteria of sustainable construction. Students will learn the principle of multi-criteria evaluation methods SBToolCZ for residential buildings in the design phase (a shortened study version).

Topics

1. Principles of sustainable development, Agenda 21, the context and scope

2. Systems of environmental assessment of buildings in the Czech Republic and abroad

3. Principle of multi-criteria evaluation of building by national method SBToolCZ (methodology, environmental criteria)

4. Principle of multi-criteria evaluation of building by national method SBToolCZ (socio-cultural criteria, economy and management)

5. Urban concept of sustainable construction, factors of site selection

6. Green concept of sustainable human settlements planning

7. Sustainable design of buildings

8. Renewable energy sources

9. Materials management of buildings, environmental labeling, eco-design

10. Waste and energy management in buildings

11. Water and its forms in envirosystem of buildings

12. Air as medium of transmission and transformation of individual agendas environment

13. Examples of environmentally evaluated buildings

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

Course objectives

This course is aimed at mastering the theoretical basis of classical physics. Graduate knows the principles of classical mechanics can describe physical phenomena and also utilizes the knowledge gained in the study of technical subjects.

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

Historical Constructions (Code: S_HIK) | Number of credits: 5

Course objectives

The aim of the course is a presentation of historic structures as valuable components of the reconstructed buildings. The student can assess the value and condition of historic structures and is able to design and evaluate methods for their remediation.

Topics

1. The importance of knowledge of historic structures in construction practice, the types of historic structures
2. Historic masonry walls
3. Stone walls and elements of corrosion and reconstruction
4. Historical ceilings and vaults
5. The historic roof trusses and roof coverings
6. Historical and floor tiles
7. Historic doors and windows, stairs and railings
8. Historic plaster, painting, editing of facades and interiors
9. Historic building services (heating, waste, ventilation)
10. Diagnostics of historic structures
11. Rehabilitation of historic structure
12. Folk architecture technology
13. Technology for restoration
14. Specific examples of the realization

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

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

Technical Buiding 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