



International Programme

List of courses taught in English

Building Construction

Academic year 2020-2021

Summer semester

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Building Construction

Course code	Course title	Number of ECTS credits
S_POS_1	Building Construction I	6
S_INF_1	Informatics I	6
S_SHM	Building Materials	6
S_SMC_1	Building Mechanics I	6
S_DAR	History of Architecture	6
S_HIK	Historical Constructions	6
S_UVB	Sustainable Construction of Buildings	6
S_TZB_1	Technical Building Equipment I	6

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

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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



Building Materials (Code: S SHM) | Number of credits: 6*Course objectives*

The subject provides a basic overview of the structure and properties of building materials and their use. There are presented laboratory tests during exercises. After completing the course the student can describe the basic raw materials and production techniques of classical building materials, and define the physical properties and the units. The student can characterize different types of cement, lime, plaster, mortar, plaster and concrete, their composition and technical characteristics and their behavior. Student can find the technical data sheets, and work with them, and explain their designation. The student orientates in the offer and can explain special adaptations of materials such as steel, wood, glass, asphalt and plastics. S/he can describe the principles of selection and ordering of building materials and knows how to describe the processes of measuring, weighing, design of concrete mixture and determining concrete strength.

Topics

Physical quantities and units

Element as the basic building unit

Binders, Mortar, Concrete, Stone, Ceramic

Materials: Wood, Glass, Metals, Asphalt, Plastics, Durability and stability of construction materials.



Building Mechanics I (Code: S SMC 1) | Number of credits: 6*Course objectives*

Students will learn types of load structures, and will know when to apply them. S/he will learn the problems of the dynamic behavior of structures. After successful completion of the course the student is able to: - calculate the cross section center of gravity and determine the ellipse of inertia, and degrees of width to determine the static structure certainty - to determine response of beams and compute their size - to calculate the axial forces in the rods of a statically truss - to determine the internal forces in statically determinate full beams (console, a simple beam, angle beam, refracted beam, slab and wall) - statically determine the action of certain complex structures (triple articulation arch, gerber`s beam) - to explain the behavior of statically indefinite structures and s/he will theoretically know the ways of their calculation. Based on the information and skills s/he will be able to decide on the choice of a supporting structure.

Topics

1. Physical quantities, scalars, vectors, physical size, strength as a vector, folding and unfolding forces
2. Torque to point and axis, a pair of static torque forces. The general spatial system of forces, the resulting effect, balance, equity
3. Degrees of width of a particle, board, body systems, static precision
4. Continuous load, strength, lonely moment and continuous torque load
5. Supporting and response of a particle, boards and bodies, supporting non-correct cases
6. Loads of building structures
7. Lattice structure, methods of calculation
8. Simple beam and bracket types of loads, calculation of reactions, internal forces

9. Refracted beam, internal forces 10. Kinematic method of calculating the response of complex systems 11. The center of gravity and moments of inertia of the cross-section 12. Fundamentals of dynamics of structures 13. The principles of solving statically implicit structures

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



Historical Constructions (Code: S HIK) | Number of credits: 6*Course objectives*

Course will offer lectures and debates about different topics from architectural history focusing on Czech cultural heritage and historical constructions, especially in period from Gothic, Renaissance and Baroque times until period of functionalism in Czechoslovakia. There will be discussed not only technical aspects but also the social aspects of architecture.

Students are able to debate about different topics from architectural history focusing on Czech cultural heritage and historical constructions, especially in period from Gothic, Renaissance and Baroque times until period of functionalism in Czechoslovakia, about technical and social aspects of architecture. 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.

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 structures 12. Folk architecture technology 13. Technology for restoration 14. Specific examples of the realization

Sustainable Construction of Buildings (Code: S 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. The aim of the exercise is to obtain basic knowledge and an overview of the complex evaluation of the quality of building in terms of criteria of sustainable construction.

Students will be able to

- identify and summarize important features of sustainable development
- explain basic principles of green building design
- Compare rating systems for sustainable buildings
- Design an energy- efficient building (passive house).

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



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 terminology, 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