International Programme

List of English taught courses offered to Erasmus+ programme and international exchange students

Building Construction

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Building Construction

Course code	Course title	Number of ECTS credits
S_POS_1	Building Construction I	6
S_SHM	Building Materials	6
S_SMC_1	Building Mechanics I	6
S_CED_1	Czech Language for Foreigners	6
S_ENG_4	English Language IV	6
S_EIP	English in Practice	6
S_UVG	Introduction to Geophysics	6
S_FYS	Physics	6
S_UVB	Sustainable Construction of Buildings	6
S_TBO	Typology of Residential and Civic Buildings	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 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

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 successful completion of 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 inexplicit structures

Czech Language for Foreigners (Code: S_CED_1) | Number of credits: 6

Course objectives

The course is prepared for foreign students. The aim of the course is reaching of A1 level of their Czech language according to the descriptor of the Common European Framework of Reference for Languages. After the completion of the course, the students will gain the following language skills:

- the students understand basic phrases which are needed for everyday communication and can use these expressions and phrases

- can introduce themselves and other people and ask simple questions concerning well known: places, people and things and react to similar questions

- they can read simple texts (notices, signs, etc.)

- they can write a simple text in Czech language (holiday postcard, fill in a simple form, etc.)

- they are introduced with culture and everyday life in the Czech Republic

- they are able to perceive the intercultural differences between their native country and the Czech Republic

Topics

1. Who is who? Verbs: to be, to have. 2. How are you?

3. People, things, relations – nouns. 4. How much is it? Money.

5. Where am I? 6. The Czech Republic, Budweis.

7. At school, at the school canteen -prepositions, conjunctions.

8. Time, days, months. 9. My family.

10. Signs. 11. Food and drink.

12. Travel. 13. Services, shopping.

English Language IV (Code: S_ENG_4) | Number of credits: 6

Course objectives

The course objective is to deepen student´s language knowledge to the level B2- of the Common European Framework of Reference for Languages. After the successful completion of the course, students are able to: understand extended speech and follow even complex arguments, understand articles dealing with contemporary problems, present a detailed descriptions on a wide range of subjects and interact with a degree of fluency and spontaneity, write clear, detailed texts on a wide range of subjects.

Topics

1. Work-life balance
2. Gender difference
3. The world of work
4. Meetings
5. Formal letters
6. Shopping and making a complaint
7. Films
8. Famous people
9. News
10. Superstitions
11. Murder mysteries
12. Television
13. How to write an article

English in Practice (Code: S_EIP) | Number of credits: 6

Course objectives

The objective of the course is to deepen students´ knowledge, enrich vocabulary and practise using English in real-life situations concerning work and study in a foreign country, the ability to give a presentation in English, improve listening, reading, speaking and writing skills. After successful completion of the course, the students are able to understand lectures, debates and participate in discussions on general topics/topics of their interest. Students understand TV and radio news, programmes and newspaper/online articles on topical issues and are able to present their views and discuss. Upon successful completion of the course, students are able to prepare and give presentation on a selected topic, communicate effectively and appropriately in real life situation, to use English effectively for study purpose across the curriculum, to develop and integrate the use of the four language skills (Reading, Listening, Speaking and Writing) and to be able to use them in any situation concerning travelling, work and study in a foreign country.

Topics

1. Providing and obtaining personal information in social situations (work, study, travelling, participation in social events); small talk. Present simple vs present continuous

2. Housing. Living in a country or in a town. Big towns in the Czech Republic. Prepositions – time, place, movement.

3. Travelling; means of transport, problems you may encounter while travelling, accommodation. Infrastructure in the Czech Republic in comparison with the student´s native country. Verbs and adjectives with prepositions.

4. System of Education (in the Czech Republic vs the student´s native country – primary, secondary, tertiary education. Grading. Comparisons.

5. Social life, culture, literature (student´s life, cultural events). Idioms.

6. Nature and environment. Environmental protection. Modals – obligation, probability. Modals in the past.

7. Health and illnesses. Human body and illnesses, health system and insurance in the Czech Republic. At the doctor´s.

8. Holidays and celebrations (the CR vs student´s native country). Shopping. Past simple, past continuous.

9. Food. Traditional meals. Eating habits, trends, healthy food. Restaurants. First conditional.

10. Jobs and occupation. Labour market in the Czech Republic. Work conditions. Second conditional.

11. CV, job applications. Job advertisements. Interviews. Word order in questions, indirect questions.

12. Media. TV, Internet, press. Fake news. Passive voice.

13. Revision. Spoken exam - presentation.

Introduction to Geophysics (Code: S_UVG) | Number of credits: 6

Course objectives

Introduction to basic topics of modern geophysics for students of natural and technical sciences. Upon successful completion of the course, students have knowledge of following topics: Earth tectonics, dynamics of mantle and core, seismology and ground motions, gravity and magnetic field of Earth.

Topics

1. Spherically symmetrical Earth model. Crust, mantle and core – physics and composition. Seismically determined interfaces. Mantle processes, mineralogy and phase transitions.

2. Plate tectonics, Wegener theory. Sea floor spreading – subduction zones, rift and transform plate boundaries, trench zones, collision zones. Heat flow, deformation and stress, seismic and volcanic manifestation.

3. Lithosphere and its history. Lithosphere thickness, heat flow and cooling.

4. Earth mantle, asthenosphere. Heat sources and transfer in mantle – convection, conduction. Plumes, subduction and seismisity of subduction zones. Hot spots and shield volcanoes.

5. Earthquakes, seismicity, source zones. Tectonic earthquakes. Seismicity and volcanism – Pacific Ring of Fire. Historical earthquakes. Seismic waves, rays and hodochrones. Earthquake location and magnitude. Seismic tomography and Earth seismic models. Seismic interfaces in Earth models. Seismic waves in Earth core.

6. Earth magnetic field and its features. Earth dynamo, role of core on magnetic field generation. Earth core composition – fundamental findings.

7. Gravity field. Density anomalies and gravitational potential. Geoid. Anomalies, topography and isostatic compensation. Free oscillations of the Earth, seismic tomography and gravity – viscosity, density and interfaces determination.

8. Methods and tools of global geophysical research: Paleotechniques in age determination. Analysis of potential fields. Direct and reverse problems solutions. Modelling and simulation techniques and their features.

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

Course objectives

The aim of subject is repeat the basic knowledge from grammar school mechanics, thermodynamics, acoustics and optic, define and characterize the basic physical principles and law. Student will solve simple problems and discuss their results. . Upon successful completion of the course, students are able to explain and apply the fundamentals of physics from following fields: mechanics, thermodynamics, optics and hydromechanics. The students are also able to use common sense to estimate the nature of physical processes.

Topics

1. System of physical quantities and units; Time and Distance 2. Kinematics of Mass Point 3. Dynamics of Mass Point 4. Work, Power, Energy 5. Mechanics of the System of Particles and Rigid Body 6. Gravitational and Gravity Field 7. Mechanical Oscillations 8. Mechanical Waves 9. Acoustics 10. Hydromechanics 11. Kinetic Theory of Matter 12. Thermodynamics 13. Optics

Sustainable Construction of Buildings (Code: S_UVB) | Number of credits: 6

Course objectives

The aim of the course 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 or 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

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