Institute of Technology, Economics and Management in Construction – COURSES – winter term

Subject: **Mathematics I (assoc. prof. Ing. Pavol Purcz, PhD.)**
Code: **2500041**
Number of credits: **7**
Semester of study: **WT**
Academic degree: **bachelor**

The main goal of this object is to learn of the students to work with basic mathematical conceptions, especially as derivative of the function of one real variable and its application for solutions of the geometrical, physical and technical problems.

Subject: **Descriptive geometry (RNDr. Katreničová, PhD.)**
Code: **2500121**
Number of credits: **6**
Semester of study: **WT**
Academic degree: **bachelor**

The main goal of the object is to learns tudents to make the acquaintance of elementary projection methods, to apply these methods for projection of basic geometrical solids, to construct plane sections of solids mainly in Monge projection, description of elementary characteristics of linear surfaces and surfaces of revolution. Gained knowledge of this object is practical for manually drawings.

Subject: **Technologies of construction processes I (Ing. Zuzana Struková, PhD.)**
Code: **2506471**
Number of credits: **6**
Semester of study: **WT**
Academic degree: **bachelor**

The aim of this subject is to inform students about building machines and plants issue. Technology of ground works as a selected chapter of building processes technology. Introduction into problems connected with choice and using of building machines and equipments in building.

Subject: **Preparation and realization of construction (Ing. Zuzana Struková, PhD.)**
Code: **2506441**
Number of credits: **5**
Semester of study: **WT**
Academic degree: **bachelor**

Information obtaining from preparation and realization construction field from point of all building partners, documentation processing of building preparation, tenders, building schedule analyses, schedule, building site plan, control and test building plan, winter arrangement project. In the part of building realization, to obtain the information about building sources management, progress of work monitoring and documentation updating for building realization.

Subject: **Charges and costs (Ing. Alena Tažiková, PhD.)**
Code: **2505951**
Number of credits: **5**

Semester of study: **WT**
Academic degree: **bachelor**

The aim of this subject, together whit subject ; building economy, is to give information about building prices and costs issue. To emphasize a relevance of prices in building industry, mainly from building market point of view. To mention a relevance of cost as a basic part of price, to emphasize their function and role at disposal production factors evidence, finding out of production efficiency, production factors control efficiency, compared competitive. The possibilities and exploiting of various cost models at the optimalization and decreasing of building processes cost. To explain the creation of building works offering prices and to emphasize the creation of market prices in building business.

Subject: **Technologies for reconstruction (Ing. Marcela Spišáková, PhD.)**
Code: **2505961**
Number of credits: **6**
Semester of study: **WT**
Academic degree: **master**

The aim is to inform the students with technologies, which are used in the building reconstruction. The students are progressively informed with particular groups of technologies for buildings reconstructions, their realization processes, including demands on applied materials, workers and machines and equipments facilities.

Subject: **Numerical mathematics and mathematical statistics (assoc. prof. RNDr. Roman Vodička, PhD.)**
Code: **2500431**
Number of credits: **5**
Semester of study: **WT**
Academic degree: **master**

The aim of the subject is to render mathematical knowledge necessary for understanding theoretical bases of civil engineering applications, with an emphasis to statistical and numerical methods and their computer implementations in MATLAB.

Subject: **Concrete construction realisation (Ing. Matej Špak, PhD.)**
Code: **2504911**
Number of credits: **5**
Semester of study: **WT**
Academic degree: **master**

The content of subject is detailed concrete realization analysis of object construction, which is involved process factors in sequence on parameter, requirements specification on concrete construction. The planning of concrete construction realization and principle for design of elements form structure and dimension are the most important. The part of this subject is computer program using for system form design.

Subject: **Management and marketing of the building industry (Ing. Tomáš Mandičák, PhD.)**
Code: **25000112**

Number of credits: **5**
Semester of study: **WT**
Academic degree: **master**

Subject Management and marketing in the construction industry is focused on the acquisition and mastery of basic knowledge of management and marketing - role and tasks of the manager in the construction business, motivation, selection and evaluation of staff, teamwork, communication, leadership staff, creativity, change management, organizational structures and culture of the organization. In addition, students should master the elements of marketing and communications mix with the possibility of their use in construction companies and marketing activity that is seen as part of the strategy, tactics and operational companies in ensuring the competitiveness and prosperity of businesses in the construction industry.

Institute of Technology, Economics and Management in Construction – COURSES – summer term

Subject: **Mathematics II (assoc. prof. Ing. Pavol Purcz, PhD.)**
Code: **2500101**
Number of credits: **6**
Semester of study: **ST**
Academic degree: **bachelor**

The main goal of this object is to give some theoretical knowledge needed for the study and application of the special technical problems, mainly using of the integration's methods and differencial equations.

Subject: **Building economy (Ing. Tomáš Mandičák, PhD.)**
Code: **2505473**
Number of credits: **4**
Semester of study: **ST**
Academic degree: **bachelor**

The aim of the course is to understand the importance of the strategic importance of the economy in construction practice. Understanding the specifics of economic construction in the analysis, planning, setting goals and strategies. Explain the process of organizing, planning and construction management using economic methods, standardization and pay in the construction industry. Emphasize the importance of prices in the construction industry particularly in terms of activity in the construction market. Highlight the importance of cost as a basic component of prices, features and emphasize their role in the design and operation of the works.

Subject: **Technologies of construction processes II (Ing. Zuzana Struková, PhD.)**
Code: **25000371**
Number of credits: **7**
Semester of study: **ST**
Academic degree: **bachelor**

The aim of this subject is to explain a basic technological mechanizes issue for concrete processes, prefabricated, mason, scaffolding and all finishing process ; surface treatment, floors, plumber constructions, insulations and installation, whit requirements on building machines, material and spatial standard. The aim of the subject is to explain main problems connected with the building processes performance, technological methods for all building processes of framework and final works including requirements on building machines, material, spatial and professional covering of these processes. Students are also informed with problems connected with quality and safety in building processes performance.

Subject: **Technological project (Ing. Jozef Čabala, PhD.)**
Code: **2506623**
Number of credits: **4**
Semester of study: **ST**
Academic degree: **bachelor**

The aim of this subject is to apply the obtained theoretical knowledge from technology and building economy fields into the terminal technological development.

Subject: **Building planning automatization (Ing. Alena Tažiková, PhD.)**
Code: **25000122**
Number of credits: **5**
Semester of study: **ST**
Academic degree: **master**

Students learn to plan the construction of automated processes and understand their importance for the efficiency of the construction process. They become acquainted with the possibilities of automation planning for the individual participants in the construction process.

Subject: **Construction project management (Ing. Tomáš Mandičák, PhD.)**
Code: **2506711**
Number of credits: **5**
Semester of study: **ST**
Academic degree: **master**

To obtain the basic information about project management, which presents the management philosophy of unique and unrepeatable activities. This theory is especially suitable for building industry, can be apply at complex management of investment building projects, at management of construction projects, construction technological projects, at more particular subprojects, which are necessary at preparation and realization all building activities as well.

Subject: **Quality in construction industry (Ing. Matej Špak, PhD.)**
Code: **2504831**
Number of credits: **5**
Semester of study: **ST**
Academic degree: **master**

The aim of this subject studying is to obtain the knowledge about generally and theoretical basis of integrated management in companies. The goal of this subject is to teach the students to analyse a management quality issue as a significant element of building quality and company success, to support their synthetic thinking and the ability of new knowledge creative application into another subjects and real problem solving.

Institute of Technology, Economics and Management in Construction – RESEARCH

Modelling of 3D objects of construction site facilities for information environment of constructions

Creation of new and modification of existing 3D models of objects (equipment, products, materials, etc.). Allocation of objects of construction site facilities in the construction site plan, conditioned by mutual connections (interactions, relationships, connections, relations, ...) in software systems. Visualization of 3D model of construction site operation in the environment of a software solution intended for the BIM platform.

Using a 3D scanner to digitize buildings

Specification of terrestrial laser scanning approaches to 3D modelling and geometric analysis of buildings. The process of transforming the spatial geometry of existing buildings into a 3D digital copy. Graphic post-processing - the process of 3D modelling and extraction of geometric characteristics from laser data.

Wood-based constructions - technological and material context

Study of construction systems of wood-based buildings within various segments of construction (residential, civil, agricultural buildings ...). Sustainability parameters of wood-based buildings in terms of construction, material, social and environmental parameters. Process innovations in the production and implementation of wooden structures.

Models for initiation and propagation of cracks in structural elements

Physical and mathematical models that combine approaches based on smeared cracks ofdamage phase-field models inside materials and cohesive zone models for cracks at material interfaces; Numerical simulations of structural elements with such defects by the proposed model implemented in a MATLAB computer code featuring finite element methods.