











COURSE DESCRIPTIONS – SPRING SEMESTER 2023

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ANTANAS GUSTAITIS' AVIATION INSTITUTE

AISVA19402	AVIATION ENGLISH 2: RULES OF RADIOTELEPHONY			3 ECTS
Lectures - N/A	Practical works - 36 hours/semester	Consultations - 2 hours/semester	Individual work - 42 hours/semester	
Course aim	The aim of the module is to acquaint students with the proper procedures for conducting radio communications and to develop their vocabulary and pronunciation skills for transmission of messages in routine and non-routine situations.			
Course description	Aviation English 2 introduces students to rules of radiotelephony, vocabulary and terminology used in radio communications, pronunciation and transmission features of messages, the structure of ATC instructions and requirements for them, develops the skills of listening to and understanding of radiotelephony in standard and non-standard situations, as well as the skills of using standard phraseology appropriately.			

AISVA19603	AVIATION ENGLISH 4			3 ECTS
Lectures - N/A	Practical works - 24 hours/semester	Consultations - 2 hours/semester	Individual work - 54 hours/semester	
Course aim	To learn speaking Aviation English up to the II level according to ICAO requirements.			
Course description	Aviation English 4 increasing lexical and grammatical knowledge alongside with speaking and listening skills in the range of leaving the aerodrome traffic zone.			

AISVA19801	AVIATION ENGLISH 6			6 ECTS
Lectures - N/A	Practical works - 60 hours/semester	Consultations - 4 hours/semester	Individual work - 96 hours/semester	
Course aim	To train language skills - grammar, lexis and pronunciation, to learn standard phraseology fluently and to use to apply language skills to non routine flight situations.			
Course description	Aviation English 6 examines various flight phases, emergency and non routine situations, enabling students to develop their speaking, listening and comprehension abilities with complicated English language units.			

AISVA19403	FLIGHT FUNDAMENTALS			3 ECTS
Lectures - 24 hours/semester	Practical works - 12 hours/semester	Consultations - 2 hours/semester	Individual work - 42 hours/semester	

Course aim	To learn the fundamentals of the flight, basics of the aircraft construction and its systems, to prepare for the later and more detailed studies. To familiarize with the pilot and air traffic roles and duties in an aviation field.
Course description	Fundamentals of Flight is an introductory course about the aircraft pilot and air traffic controller speciality. This course covers the basics of various subjects and their topics. During the course the basics of an aircraft control is introduced, general principles of various aircraft systems are explained, preflight preparations tasks, pilot and air traffic controller roles are introduced. Course covers the basics of the practical navigation and meteorology, legal aspects when flying in the Lithuanian airspace.

AISVA19401	GENERAL NAVIGATION			6 ECTS
Lectures – 48 hours/semester	Practical works - 24 hours/semester	Consultations - 4 hours/semester	Individual work - 84 hours/semester	
Course aim	To teach about the visual navigation and its fundamentals, various concepts and rules which are used during the flight and during the preflight preparation.			
Course description	General navigation is the speciality subject for the pilots and air traffic controllers. General navigation covers preparation for visual and radio navigation flight and is intended to give knowledge about various navigational calculations, to perform navigation during the flight. During the course various navigation coordinate systems, maps projection techniques are studied. Students are introduced with the measurement units used in navigation, learn how to use navigation-logarithmic ruler, how to fill in the information into the flight plan.			

AISVA22601	METEOROLOGY			9 ECTS
Lectures – 60 hours/semester	Practical works - 24 hours/semester	Consultations - 6 hours/semester	Individual work - 150 hours/semester	
Course aim	To give knowledge how meteorological elements and parameters influence on aircrafts flights, international, national requirements for meteorological flight documentation, weather reports forecasts then interpret and apply information to flight situation.			
Course description	Aeronautical meteorology international standards and recommended practices. Meteorological service for international air navigation. The influence of meteorological conditions on aircrafts and helicopters flights with new normative documents taken into account the principles and techniques of meteorological provision of the aviation that more effective performance characteristics make flights safe, regular and economic.			

AIAIA19801	UNMANNED AERIAL VEHICLES AND THEIR SYSTEMS			3 ECTS
Lectures – 30 hours/semester	Practical works - 2 hours/semester	Consultations - 15 hours/semester	Individual work - 33 hours/semester	

Course aim	To provide knowledge about autonomous aircraft and their systems, provide skills for searching and reviewing information on autonomous aircraft, to understand impact of autonomous aircraft on human activities and natural environment.
Course description	The course of Autonomous aircraft and systems provides knowledge of autonomous aircraft, control principles, applied technical equipment and software.

AIAIM22200	ASTRODYNAMICS			6 ECTS
Lectures – 30 hours/semester	Practical works - 15 hours/semester	Consultations - 4 hours/semester	Individual work - 111 hours/semester	
Course aim	Astrodynamics is the keystone of every space mission, thus the aim of the course is to provide the fundamental knowledge regarding body motion subject to gravitational and other forces. Students will learn to describe and analyze spacecraft trajectories, focusing on the mathematics and physics behind these concepts. The acquired knowledge will be applied by simulating body motion in Matlab and Simulink.			
Course description	During the course students get familiar with the fundamentals of astrodynamics: body motion subject to gravitational and other (thrust and aerodynamic drag) forces, reference frames and orbital elements, two-, three-body problems are analyzed, including interplanetary trajectories and relative spacecraft motion.			

AIAIM19201	COMPUTER-AIDED ENGINEERING (CAE)		9 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work - 176 hours/semester	
Course aim	To provide knowledge on backgrounds of Finite Elements Method, FEM based computational technology and application to engineering (incl. aerospace structures) problems. To get the ability and skills to practical application the FEM software.		
Course description	Concept of finite element method. Definitions. Standard discrete system. Diskretization of continua. Interpolation functions. Two-dimensional elements. Three-dimensional elements. Thin walled elements. Non-linear and time dependent problems. Applications to aerospace structures. Data procession technologies. Elements types and discretization procedures.		

AIAIM17195		MASTER GRADUATION THESIS		30 ECTS
Preparation for evaluation – 30 hours/semester		Final thesis - 770 hours/semester		
Course aim	Completion of the research work. Analysis and generalization of results. Preparation and defense of the prepared Master Thesis in order to substantiate that the obtained competence corresponds to the Aeronautical Engineering Master level.			
Course description	Completion of the research work preparation of Master thesis report. Analysis and generalization of the results. Preparation of the material the scientific conference (or a paper for a scientific journal). Preparation and defense of the prepared Master Thesis in order to substantiate that the obtained knowledge, experience and competence corresponding to the Aeronautical Engineering Master level. The prepared conference report or paper must be presented in an appendix of the Master thesis.			

AIAIM22203		MICROSATELLITE ENGINEERING		6 ECTS
Lectures – 30 hours/semester		Practical works - 15 hours/semester	Consultations - 4 hours/semester	Individual work - 111 hours/semester
Course aim	To provide the knowledge regarding autonomous aerial vehicles and autonomous space vehicles technologies and systems, principles of operations, which on its turn will allow students to select the further direction during the master studies. To motivate students to investigate and research new technologies and systems, motivate the innovative thinking, search for new scientific knowledge.			
Course description	During the course students get familiar with main elements of the Unmanned Aerial Vehicles and Automated Space Vehicles elements of technology like: powerplants, energy storage and supply, attitude and position determination systems and algorithms, thermal systems, radio communication systems, surveillance systems etc. Since in these days similar systems and algorithms on Unmanned Aerial Systems and Space Vehicles are used, the course includes both subjects.			

AIAIM17188		RESEARCH WORK 2		3 ECTS
Preparation for evaluation – 10 hours/semester		Research work - 70 hours/semester		
Course aim	Analysis of theoretical methods and their application for the selected problem.			
Course description	Analysis of theoretical methods and their application for the selected problem.			

AIAIM22202	UNMANNED AERIAL VEHICLE SYSTEMS			6 ECTS
Lectures – 30 hours/semester	Practical works - 15 hours/semester	Consultations - 4 hours/semester	Individual work - 111 hours/semester	
Course aim	To provide students with the knowledge regarding the systems of autonomous aerial vehicles, principles of their operations and ways to improve that. To motivate students to investigate and research new technologies and systems, motivate thr innovative thinking, search for new scientific knowledge.			
Course description	During the course students will get familiar with the main systems of Unmanned Aerial Vehicles, their functioning, influence on the performances on operations of entire vehicle, fault diagnostics etc. Such systems as: aircraft control, electrical, powerplant, position determination, safe emergency landing etc. will be discussed.			

ARCHITECTURE FACULTY

ARPGA17012	HISTORY AND COMPOSITION OF LITHUANIAN ARCHITECTURE			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations - 2 hours/semester	Individual work - 98 hours/semester	
Course aim	Presentation of the architectural styles in Lithuania, analysis of local peculiarities of architectural and urban planning development in Lithuania from the earliest period to the end of the 20th c. To master the method of structural analysis, while studying the composition of historic building and to give the ability to apply the results of analysis for creative work.			
Course description	The discipline consists of two parts: theoretical and practical. During the lectures, the peculiarities of Lithuanian architecture are revealed in every historic period of its development. The typical and unique features of Lithuanian Pre-Gothic, Gothic, Renaissance, Baroque, Classical, vernacular architecture, urban planning and cultural landscape formation traditions are analyzed. During the workshops and practical classes the historical architectural object is studied according the structural analysis method, and the causality of the building composition, structure, properties. is highlighted. The results of the study is used for the creation of the abstract artistic spatial composition.			

ARURA16006	ARCHITECTURE AND HERITAGE			15 ECTS
Lectures – 15 hours/semester	Practical works – 75 hours/semester	Consultations - 10 hours/semester	Individual work - 300 hours/semester	

Course aim	Architect professional abilities to regenerate the urban fabric and renovate the existing buildings, taking in to account the evaluation of historically developed urban structure, values of architectural objects and different social need are educated.
Course description	The combination of theoretical knowledge and practical workshops are addressed to solve the regeneration of urban structures and building renovation tasks. The abandoned or devoured blocks of the towns' central parts as well as the conversion industrial areas or the Soviet residential areas waste-lands are selected for the course project. The aim of the projects urban design part is a new urban design quality of the historic environment and harmony without violation of the existing or new spa-tial structure creation in wasteland. The aim of the project architectural part is - a renovation project of a real building in the present situation, which is being prepared in consideration of the existing property values and new social, artistic and technical requirements arising during the renovation process.

ARARA22006	ARCHITECTURE AND HERITAGE			15 ECTS
Lectures – 15 hours/semester	Practical works – 75 hours/semester	Consultations - 10 hours/semester	Individual work - 300 hours/semester	
Course aim	To get acquainted with the innovation, diversity and potential of modern architecture, to draw up a specific destination pioneering, innovative architectural object design using progressive design methods and tools.			
Course description	The combination of theoretical knowledge and practical workshops are addressed to solve the regeneration of urban structures and building renovation tasks. The abandoned or devoured blocks of the towns' central parts as well as the conversion industrial areas or the Soviet residential areas waste-lands are selected for the course project. The aim of the projects urban design part is a new urban design quality of the historic environment and harmony without violation of the existing or new spatial structure creation in wasteland. The aim of the project architectural part is a renovation project of a real building in the present situation, which is being prepared in consideration of the existing property values and new social, artistic and technical requirements arising during the renovation process.			

ARARA17005	ARCHITECTURE AND TECHNOLOGY			15 ECTS
Lectures – 75 hours/semester	Practical works – 120 hours/semester	Consultations - 10 hours/semester	Individual work - 195 hours/semester	
Course aim	To acquire the object of architecture integrated design approach to understanding and appreciating the artistic and technological knowledge and skills to apply them to the importance of high-quality, sustainability-based architecture artistic expression.			
Course description	Course content is based on the architectural design of the building and technological solution to complex issues, the development of a multistory (residential and public) facility project in a real urban environment. The module			

	consists of three blocks of different subjects, tutored individual university departments: - Residential building conceptual architectural and reduced technical- work project (main Department- Architectural); - Residential buildings, mechanical stability, structural systems and materials, fire safety (Faculty of Civil Engineering Department); - Building energy and HVAC systems (buildings Energy Department); Module separate subjects exercises are practical capacity-building complex in architectural designing process.
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ARPGA17018	ARCHITECTURE RESEARCH METHODOLOGY			6 ECTS
Lectures – 20 hours/semester	Practical works – 20 hours/semester	Consultations – N/A	Individual work - 120 hours/semester	
Course aim	To develop scientific research skills, foster scientific critical creative thinking and competence.			
Course description	An introductory course surveying the basic methodologies of science and research methods as they apply to the field of architecture. Acquired knowledge and competence will be helpful for the fulfilment of final work and for carrying out of scientific researches urgent in professional activity.			

ARPGA19023	BASICS OF BUILDING INFORMATION MODELING			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations - 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To introduce the basic principles of building information model (BIM) and its management requirements, using computer aided design systems. After completing this course will be able to read, understand and create building construction drawings. Will be able to manage the process of BIM life cycle and develop teamwork skills.			
Course description	Building Information Modelling (BIM) application using engineering graphics software. Building information modeling computer software, and it's features for civil engineering. Parametric modeling of building elements and their descriptive information. Preparation of building three-dimensional models. Building element and construction detailing using building information modeling tools. Preparation of the drawings. Views arrangement in the drawings. Construction drawing. Material schedules and bill of materials. Building plan, section, elevation formation. BIM and CAD data management and standards. Plotting graphs and using them in documents. Project visualization, renderings and presentation. Team workflow in BIM projects.			

ARPGA17005	CONTEMPORARY ART PROJECT AND ARCHITECTURE			3 ECTS
Lectures – N/A	Practical works – 45 hours/semester	Consultations - 2 hours/semester	Individual work - 33 hours/semester	

Course aim	Comprehension of theoretical background and practice of contemporary art. The aim is to foster critical thinking and skills of innovative interdisciplinary artistic production as well as understanding of possibilities to apply it in rethinking of architecture and activation of urban public spaces.
Course description	Visual art module provides knowledge about relevant ideas and methods of contemporary art practice and supports students in the development and realization of the art project contextually and conceptually related to architecture. The emphasis of the module is on innovative multidisciplinary art practice with aesthetic and critical capacity to rethink social space.

ARPGA17003	DRAWING 2			6 ECTS
Lectures – N/A	Practical works – 60 hours/semester	Consultations - 4 hours/semester	Individual work - 96 hours/semester	
Course aim	To train perception of space and to develop free hand drawing skills as means to record and express the construction, proportions, character and atmosphere of spatial forms - buildings, interior and exterior views and imaginary spaces.			
Course description	Visual art module provides knowledge and skills of graphic representation of spatial forms by exercising sketch, study and interpretation types of free hand drawing. The ability to represent construction, proportions, character and atmosphere of spatial and volumetric forms, architectural objects and spaces are developed by drawing buildings, interior and exterior views and imaginary spaces. The problems of assignments progress from the representation of what is seen, to the conveying of personal perception of space and representation of imaginary spaces. Mastering of the use of various means of drawing - graphite, charcoal, ink.			

ARARA20202	FUNDAMENTALS OF ARCHITECTURAL DESIGN			15 ECTS
Lectures – 45 hours/semester	Practical works – 150 hours/semester	Consultations - 10 hours/semester	Individual work - 195 hours/semester	
Course aim	Module is dedicated to develop abilities of making the architectural project of the simple object using knowledge of design methodologies. Knowledge of technologies (low rise building constructions and materials),			
Course description	Module is dedicated to develop abilities of making the architectural project of the simple object using knowledge of design methodologies. Knowledge of technologies (low rise building constructions and materials), physical sciences (geodesy), computer design and art things (spatial composition) are part of this module too.			

ARPGA17010	HISTORY OF ARCHITECTURE 1			3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations - 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To get acquainted with architectural features and contexts from the oldest civilizations to the end of the 19th century, to provide skills to analyze their causes and interactions.			
Course description	This course transverses through the development of Western architecture from its prehistoric origins to the end of the 19th century. Along the study of architectural forms, a great emphasis is given to a particular context and reasons that contributed to the development of styles. This course introduces to the fundamental writings on architecture that shaped it then and in the centuries that followed. The lectures include examples of Lithuanian architecture, and bring the fundamental events within the history of landscape architecture. Short weekly reading and short writing are required. Exam contains written/oral and drawn tasks.			

ARPGA17015	HISTORY OF URBAN FORM AND COMPOSITION			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations - 2 hours/semester	Individual work - 98 hours/semester	
Course aim	The aim of urban form history is to help the intended architects to understand the formation of surroundings and corresponding professional activity as the historical, evolutionary phenomenon. The module should give the basics of knowledge, necessary for the professional activity, directly or indirectly touching the field of cultural heritage. The Urban Composition course aims at the following: to provide students with theoretical knowledge and basic practical experience about a city as the pro.			
Course description	The evolution of the permanent settlements is presented in the first part of the course (Urban history). The peculiarities of Physical and functional organization and the influencing factors (evolution of the worldview, social, economical changes, condition of nature) are analyzed. The relations between the historical knowledge and professional culture are discussed to. Taking the course of Urban Composition students are introduced to the key elements of urban structure, theories of its analysis, principles and instruments of urban space formation as an object of artistic creation, as well as their application possibilities in creative practice.			

ARURA17003	URBAN STRUCTURES			15 ECTS
Lectures – 45 hours/semester	Practical works – 150 hours/semester	Consultations - 10 hours/semester	Individual work - 195 hours/semester	
Course aim	To provide students with knowledge necessary for understanding of contemporary urban development processes (trends and challenges) and solving complex urban design and planning tasks, as well as to develop professional skills in the fields of urban analysis, urban design and planning.			

Course description	Students are familiarized with the process of urban development, as well as methodology and principles of integrated urban development. Practical work is composed of successive tasks which develop professional skills in the fields of urban analysis, urban planning and urban design. Urban analysis of selected small Lithuanian town is performed and findings are summarized. After assessment of the quality of town's urban structure, alternative urban growth models are prepared, combining potential of external and internal development opportunities. Selected urban model is further developed into urban concept, unfolding major proposals for modernizing of urban structure and sustaining spatial identity of the town. Later detailed urban design solutions for the site in the central part of the town are prepared.
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ARARA16003	PRACTICE OF ARCHITECTURAL MEASUREMENTS			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – N/A	Individual work - 50 hours/semester	
Course aim	The aim of urban form history is to help the intended architects to understand the formation of surroundings and corresponding professional activity as the historical, evolutionary phenomenon. The module should give the basics of knowledge, necessary for the professional activity, directly or indirectly touching the field of cultural heritage. The Urban Composition course aims at the following: to provide students with theoretical knowledge and basic practical experience about a city as the pro.			
Course description	The evolution of the permanent settlements is presented in the first part of the course (Urban history). The peculiarities of Physical and functional organization and the influencing factors (evolution of the worldview, social, economical changes, condition of nature) are analyzed. The relations between the historical knowledge and professional culture are discussed to. Taking the course of Urban Composition students are introduced to the key elements of urban structure, theories of its analysis, principles and instruments of urban space formation as an object of artistic creation, as well as their application possibilities in creative practice.			

ARPGA17024	PROTECTION OF IMMOVABLE CULTURAL HERITAGE			6 ECTS
Lectures – 45 hours/semester	Practical works – 15 hours/semester	Consultations - 4 hours/semester	Individual work - 98 hours/semester	
Course aim	Training of expert abilities of students in the field of contemporary problems of immovable cultural heritage protection. To provide the knowledge on the identification of the architectural styles of the objects of the architecture and the ability to apply them.			
Course description	Protection requirements of architectural heritage buildings, their complexes, sites, and cultural landscape, are presented, interrelation of their evaluation and treatment with problems of urban development are analyzed. The principles of safeguarding, established by international, foreign and Lithuanian cultural heritage protection			

	documents and projects, are revealed. The targets of recording and preservation of buildings and sites under restoration or rebuilding are analyzed in situ. The development of the structural elements of the architectural styles and their architectural forms is analyzed through the resources of iconography and historiography as the fundamentals for the identification of the architectural styles.
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ARPGA22025	THEORY OF CITY CULTURE AND ARCHITECTURAL CRITICISM			3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – N/A	Individual work - 50 hours/semester	
Course aim	To get acquainted with the developments of most essential problems of city culture as well as historical development of city culture models and their reflection in academic literary sources as well as providing an understand in of most recent concepts related to city culture and its renewal.			
Course description	City culture theory part contains discussion of city origins, choosing a site and the role of ritual in the process of city-making. The origins and development of ideal cities is considered as well as its relation to later tradition of utopianism in urban imagination as well as urban dystopias. The most essential concepts of a city in modern period and their relation to the processes of urban renewal are analyzed (P. Geddes, C. Sitte, F.L.Wright, L.Mumford, C.A.Doxiadis, J. Jacobs, etc. The present concepts and models of future cities: cities of consumption, green, creative, sustainable and other as well as their causes are considered. The architectural criticism part deals with issues: what is architectural criticism; what makes the specificity of architectural criticism; the cultural, aesthetic and social role of architectural criticism are considered. Forms, types and genres of architectural criticism are scrutinized; essential skills of analysing architecture are developed through writing an essay, principles and strategies of essay writing are discussed.			

ARPG17008	CONTEMPORARY ART COMMUNICATION			6 ECTS
Lectures – 24 hours/semester	Practical works – 24 hours/semester	Consultations – 4 hours/semester	Individual work - 108 hours/semester	
Course aim	To provide knowledge of communicational means and methods as practiced in contemporary art and to foster ability to comprehend these models as well as to apply them creatively in production of mass media projects.			
Course description	The course is aimed to introduce contemporary art as conceptual and discursive practice, embracing critical communication of relationship between art and everyday life, public and private sphere, social, political and aesthetic ideas. The students will be guided to understand and to interpret the contemporary art works as open communicational structures, defined and modeled by their relation to cultural context and receiver. The course is structured into series of lectures, seminars and the course project aimed to reconstruct selected contemporary art pieces through application of mediation and communication means specific to them.			

BUSINESS MANAGEMENT FACULTY

VVFRB22801	BEHAVIORAL FINANCE			6 ECTS
Lectures – 24 hours/semester	Practical works – 24 hours/semester	Consultations - 4 hours/semester	Individual work - 108 hours/semester	
Course aim	To provide students with knowledge about the development of financial behavior theories, to train them to identify the models of individual people financial behavior and to take rational financial decisions.			
Course description	The course of behavioral finance analyses peculiarities of financial and investment decisions with regard to human psychology and emotional factors. The relationship of psychology and finance, the impact of investors' psychology on the processes in financial markets is analysed. Students get information about the main financial motives of individuals: having cash, protection, money accumulation and asset management. The theories explaining financial behaviour of people are analysed: John M. Keynes' absolute income hypothesis, Franco Modigliani and Richard Brumberg life cycle hypothesis, Milton Friedman's permanent income hypothesis. Students learn to distinguish and assess the cognitive biases. Using the provided knowledge and skills, students learn to take rational financial and investment decisions in different life cycle stages and to ground their selection.			

VVVKB17808	BUSINESS COMMUNICATION			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To provide knowledge about the business communication process, peculiarities and determinants, to develop students' ability to understand and analyse business communication process and effectively communicate in the context of the professional activities.			
Course description	Business communication course encompasses an overview of communication theories, conceptual framework, functions and peculiarities, macro and micro contexts of business communication. There is provided knowledge on verbal (written and oral) and non-verbal, internal and external business communication. The practice of communication, its determinants are analysed and practical skills of business communication are developed.			

VVTEB16204	BUSINESS LAW			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	Individual work - 96 hours/semester	
Course aim	The aim of the course is to analyze and evaluate regulation of business relations.			

Course description	Business Law is a branch of Civil Law which regulates relations settled in business. This course introduces students to fundamentals of Law, analyzes subjects of business Law and their legal aspects as well as establishment, activity, reorganization, liquidation, monopolistic activities of companies and main features of antimonopolistic Law. The course also introduces main aspects of Competition law and legal regulation of EU Company Law.
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VVTEB16403	BUSINESS LAW			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	The aim of the course is to analyze and evaluate regulation of business relations.			
Course description	Business Law is a branch of Civil Law which regulates relations settled in business. This course introduces students to fundamentals of Law, analyzes subjects of business Law and their legal aspects as well as establishment, activity, reorganization, liquidation, monopolistic activities of companies and main features of antimonopolistic Law. The course also introduces main aspects of Competition law and legal regulation of EU Company Law.			

VVTVB17272	BUSINESS PROJECTS (WITH COURSE WORK)			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations - 4 hours/semester	Individual work - 98 hours/semester	
Course aim	To provide theoretical and practical knowledge about business projects, their concepts, classification, the variety of project life cycles, the peculiarities of jobs performed in separate project phases, project research performance methodologies, their application peculiarities for separate business projects, to provide knowledge on project research conducting, investment and production cost estimation, evaluation of particular project with regard to financial, economic and social aspect.			
Course description	This subject analyses business projects, their types, project life-cycles, job peculiarities performed in the separate phases of the project, project research (feasibility study) performance methodologies. The order of project research performance is analysed in details, discussing the jobs necessary to perform in every department in order to implement the project, as well as the resources required for these jobs. The sequence of project financial analysis performance is investigated, as well as financial, economic, social and efficiency indicators, risk and uncertainty analysis, risk evaluation methods and ways of risk diminishing. The peculiarities of project preparation and evaluation are analysed with regard to achievement of financial support from EU structural funds.			

VVEIB18408	COMPLEX PROJECT OF ECONOMIC ENGINEERING			6 ECTS
Lectures – N/A	Practical works – 45 hours/semester	Consultations – N/A	Individual work - 115 hours/semester	
Course aim	To apply the theoretical and practical knowledge of study methods in solving economic problems, taking into account changes in the environment and the principle of efficiency, as well as gaining the ability to use mathematical modeling, cost, capital and profitability management, as well as other methods.			
Course description	The complex project combines the theoretical knowledge acquired during the studies of the subjects of economic engineering programs (public sector, international and digital economy and pricing), solving problems related to economic processes. The preparation of the complex work consists of searching, analysis and systematization of scientific literature, collection and processing of statistical data, selection and application of appropriate research methods, formulation of conclusions and recommendations.			

VVFRB16607	COURSE PROJECT OF FINANCIAL ANALYSIS			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – N/A	Individual work - 30 hours/semester	
Course aim	To provide theoretical and practical knowledge about role of financial analysis in financial engineering and management system, about its essence and fundamentals. To provide theoretical and practical knowledge about application of financial analysis methods, interpretation and summary of their results. To provide abilities to evaluate and absorb results of financial analysis and their importance in enterprises preparing the evaluation of absolute and relative financial ratios.			
Course description	Purposes, sources and methods of financial analysis. Absolute and relative ratios. Ways of evaluation, comparison and forecasting of financial results. Methods of analysis of enterprises' financial condition, creditworthiness, operations.			

VVEIB18801	CREATIVE ECONOMY			3 ECTS
Lectures – 24 hours/semester	Practical works – 24 hours/semester	Consultations – 2 hours/semester	Individual work - 30 hours/semester	
Course aim	Acquaint with objective of creative economy, origins of the process, influence to nowadays local, national and global environment. Develop skills to identify cultural and creative economy, evaluate upon systematic methodologies. Acquire general competence to identify and define creative economy activities, give a sense in realistic environment; analyze political documents, scientific literature.			

Course description	Creative economy module covers theoretical, practical, managerial creative activities which refer to holistic approach and form contemporary understanding of creative economy as phenomena based more on ideas not physical capital.
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VVEIB18402	DIGITAL ECONOMICS			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	Individual work - 96 hours/semester	
Course aim	Acquaint with objective of digital economy, origins of the process, influence on local, national and global business environment. Develop skills to identify digital economy. Acquire general competences to identify and define digital economy models, give a sense in realistic environment; analyse legal and political documents and scientific literature as well as model related Project ideas.			
Course description	Digital economy module covers theoretical, practical, managerial activities which refer to holistic approach and form contemporary understanding of digital and smart economy.			

VVEIB17198	ECONOMICS			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To provide the fundamentals of economic knowledge and the skills to apply them in professional activities.			
Course description	During the course of Economic theory student study economic theory: micro and macroeconomics, economic issues and objectives. The measurement of individual markets: supply and demand balance and its elasticity. Analyzes the market competition models: perfect and imperfect competition. Study what the consumer and producer behavior in the market, what are the costs and benefits, how they are calculated. Study, how measured by production volume - national product. Analysis of cyclical fluctuations, fiscal policy, monetary policy, unemployment and inflation, anti-inflation and stabilization policies.			

VVEIB17099	ECONOMICS OF ENTERPRISES (WITH COURSE WORK)			6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	Individual work - 111 hours/semester	
Course aim	The aim of course is to provide fundamental knowledge about enterprises and their goals. Prepare professional specialists be able to make and implement decisions, flexible in using theoretical and practical knowledge about enterprises, be able to generate ideas, apply study material in new and rapidly changing business situations, estimate business perspectives.			

Course description	The course of Economics of Enterprises provides systematized knowledge about an enterprise as an object of market economics. Economics of production, labor and material resources. Assets of an enterprise and their sources of financing. Economics of investment and innovations. Business risk. Measures for reducing risk. Financial statements. Taxation. Financial analysis of enterprise activity. Business development.
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VVEIB17201	ECONOMICS OF PUBLIC SECTOR (WITH COURSE WORK)			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	Individual work – 96 hours/semester	
Course aim	To provide basic knowledge about the principles of public sector economy and the practical problems of its functioning and to train facilities and to assess the key issues of public sector economy.			
Course description	The Economics of Public Sector familiarizes with the public sector role in the economy, public sector structure and key levers of economic management - fiscal and social policy, issue of State's finance, State's revenue and expenditure policy, unemployment, employment, labour market policy, social exclusion, social security and health security, the financing of education, job, its remuneration and efficiency, analysis of socio-economic processes efficiency.			

VVTVB22201	ENGINEERING PRINCIPLES			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work – 33 hours/semester	
Course aim	To provide knowledge of engineering science and practice of the essence and significance, to assess the capacity of engineering facilities, products, processes, innovative development.			
Course description	Engineering Principles course presents Engineering science, practices and products (goods, services, processes, core, value, place of education and economic systems). All types of technologies and materials are discussed: High-technology engineering; traditional and renewable sources of energy and heat engineering, electrical, computer engineering; Modeling, design, construction of architecture, transportation. Environmental and land management, ecology, and other engineering processes; Engineering staff, management strategies, economic and managerial aspects, standards, quality, and reliability. Natural resources, water, raw materials, aggregates materials, metals, polymers, ceramics, composites, and other innovative materials, their classification, receiving, structure, properties, rational use, waste, ecological recovery.			

VVTVB17087	ENTREPRENEURSHIP (WITH COURSE WORK)			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations - 4 hours/semester	Individual work - 96 hours/semester	
Course aim	To provide integrated system of theoretical and practical knowledge of entrepreneurship, which would allow students to orient themselves better in national and international environment while incepting and developing business companies. Knowledge of entrepreneurship would let to solve urgent management and economic issues in order to maintain performance sustainability and efficiency of business companies.			
Course description	Entrepreneurship as learning subject provides possibility for students to obtain economic, managerial, and sociologic (theoretical and practical) knowledge about inception and development of enterprises. A wide spectrum of theoretical and practical approaches towards specifics of contemporary business: recognizing and evaluation new opportunities, designing business models, choosing financing sources and predicting modes of business closing. Various types of organizations, their alliances, business growth specifics in Europe and USA are being considered.			

VVEIB19880	EU ECONOMIC POLICY			3 ECTS
Lectures – 24 hours/semester	Practical works – 16 hours/semester	Consultations - 2 hours/semester	Individual work - 38 hours/semester	
Course aim	To provide knowledge about the principles of the formation of the EU economic policy and the possibilities of its implementation, to develop the ability to systematically examine the EU documents and databases and to make proper use of the opportunities created in the EU single market.			
Course description	The subject of EU economic policy is designed to examine the EU's economic priorities, policy development and implementation practices. While studying the subject students analyze the experience and achievements of the EU common economic space, examine the economic goals of policies pursued in various fields (business, environment, energy, education and research, transport, taxation, social and health affairs, agriculture);as well as the tendencies and directions of the formation of the EU regional policy, the EU budget and monetary policy and the EU structural funds are studied.			

VVFRB20601	FINANCIAL ANALYSIS			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	Individual work - 96 hours/semester	

Course aim	To provide theoretical and practical knowledge about role of financial analysis in financial engineering and management system, about its essence and fundamentals. To provide theoretical and practical knowledge about application of financial analysis methods, interpretation and summary of their results. To provide abilities to evaluate and absorb results of financial analysis and their importance in enterprises preparing the evaluation of absolute and relative financial ratios.
Course description	Purposes, sources and methods of financial analysis. Absolute and relative ratios. Ways of evaluation, comparison and forecasting of financial results. Methods of analysis of enterprises' financial condition, creditworthiness, operations.

VVFRB16606	FINANCIAL MARKETS AND INSTITUTIONS			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To provide with theoretical and practical knowledge about the structure of financial institutions, peculiarities of money and capital markets, basic types of securities, their characteristics and ratios, the role of financial institutions in the economy. To endow ability to assess processes in financial markets, summarise results and to make economically reasonable investment decisions.			
Course description	The course Financial Markets and Institutions deals with the structure of contemporary financial institutions, their peculiarities, role in the economy, process of financial intermediation, basic instruments of money and capital markets, the theory of interest rate.			

VVFRB22802	FINANCIAL RISK MANAGEMENT			6 ECTS
Lectures – 24 hours/semester	Practical works – 24 hours/semester	Consultations – 4 hours/semester	Individual work - 108 hours/semester	
Course aim	To provide students with theoretical and practical knowledge about financial risks and their management, also to provide students with complex knowledge about risk assessment instruments, methods and models and train students to apply them.			
Course description	The course of financial risk management analyses financial risks and their management in financial institutions, as well as in other companies and organizations. A lot of attention is given to separate types of risks, such as market risk, liquidity risk, credit risk and operational risk. The sources of these risks, as well as their management possibilities and processes are analysed. Students get information about risk assessment models and learn to apply them to assess risk in bank or other credit institution. The relationship of risk management process with the strategy of financial institution is analysed. Also it is studied what financial risks are encountered by non-financial organizations and how they can be managed.			

VVKB20401	HUMAN RESOURCES MANAGEMENT			3 ECTS
Lectures – 20 hours/semester	Practical works – 10 hours/semester	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To form theoretical understanding of human resources management and to train to practically apply these skills.			
Course description	The main of concepts of human resources management, the significance of the strategic human resource management in the context of the organization, the main preconditions of human resources management system organization and management are presented in the course of human resources management.			

VTVB19801	INFORMATION MANAGEMENT SYSTEMS			3 ECTS
Lectures – 24 hours/semester	Practical works – 16 hours/semester	Consultations - 2 hours/semester	Individual work - 38 hours/semester	
Course aim	To prepare business intelligence specialists with integrated business analytics knowledge, able to integrate ICT, information systems, quantitative and qualitative analytical and research methods, integrate economic, information technology and management theories into their professional activities in search of practical solutions for the analysis, evaluation and forecasting of company activities taking into account changes and perspectives of the external and internal environment.			
Course description	The concept of information management systems (IMS) and their support in different management layers. Information and Communication technologies (ICT). Business Management Systems, their classification. Information Management Systems, their impact on business: competitiveness, organizational management structure, corporate culture. Integrated management information systems. Information Management Systems development, planning and organization.			

VVKB17029	INTERCULTURAL COMMUNICATION			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To prepare specialists for business and public companies, institutions and organizations, which have knowledge and skills in intercultural communication area.			

Course description	Intercultural communication course is analysing conception of the intercultural communication, functions, influence areas and peculiarities of international business. Development of the intercultural communication science and micro and macro contexts of communication are studied. Conception of the culture is presented, elements, culture cluster theories and it's use in communication are analysed, knowledge about verbal and nonverbal communication external and internal communication (written and oral), and it's realisation in international organisations are squired, including communication peculiarities in the context of organisational networking. Cultural adoption process and it's phases, international competence structure and educational peculiarities are studied, practical intercultural communication skills are aquired.
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VVEIB20601	INTERNATIONAL ECONOMICS			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	Preparation of professionals able to holistically understand and analyze the international economy, its evolution and development processes. The professionals will be able to offer management solutions according to the context and challenges of internationaleconomics.			
Course description	During the course of International Economics the following scientific areas are explored: concept development of moderninternational economics; variety of international economics theories and their application; main sectors of international economicsand their peculiarities; specific phenomenon of international economics; international business; conception of internationalbusiness; international trade; international finance; direct foreign investment; international economic co-operation; countries andinternational organizations role in regulating the international economics, markets, competition, national economics; challenges ofinternational economics development; global economics, its challenges and priorities for development.			

VVFRB17603	INTERNATIONAL FINANCE			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	The aim of the course is to teach students to understand the principles of functioning of the multinational financial system, its importance, benefits and risks, development trends, the role of the multinational finance managing the cross-border financial flows, be able to valueate the currency exchange rate fluctuation factors and trends, understand corporate cross-border investments and investment into the financial markets and fundamental and technical methods for such investment valuation.			

Course description	Multinational Finance course analyses the principles how the international financial systems function, its importance, benefits and risk, as well as discloses its development trends, the role of the multinational finance managing the cross-border financial flows, extends the risks of currency exchange rate fluctuations, its trends, presents up-to-date knowledge of nowadays global financial system, market functioning and development, explains the role of the international financial institutions in the financial markets, as well as overviews fundamental and technical methods for corporate cross-border investments and investments into the financial markets, valuation. During the course, it is focused on development of practical and theoretical knowledge about the role of the multinational finance in nowadays modern and global world, as trends of the multinational finance system development, the role of the European monetary system and European monetary union.
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VVTEB16805	LAW			3 ECTS
Lectures – 24 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	Individual work - 54 hours/semester	
Course aim	To indoctrinate students with the fundamentals of law, with system of law and order, the basic legal acts.			
Course description	Description of law fundamentals: Source of the law, legal relations, breach of the law and legal responsibility, efficiency of the law, legal culture, structure of legal regulation, lawful behaviour, validity of the law, gaps of the law, its elimination.			

VVTVB17173	LOGISTICS			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations - 4 hours/semester	Individual work - 96 hours/semester	
Course aim	To prepare Bachelors of Business Management who would have integrated knowledge of business logistics management and knowledge related to other professional activity and be able to apply general and special abilities of business planning, organising, coordination and implementation in the private and public sector and to use them constructively in wide range of professional activity, to create and develop business, to be prepared for constant improvement through lifelong learning.			
Course description	During the course, the concept and tasks of contemporary logistics are analysed, the place in the life of enterprise and society is described. Such aspects of logistics as client service, order processing, organization of transportation, inventory and warehouse management as well as management of material flows are introduced and relations between these aspects are analysed.			

VVEIB17191	MACROECONOMICS			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations - 4 hours/semester	Individual work - 96 hours/semester	

Course aim	To provide students with the basic knowledge in macroeconomics and with competences to identify them and to apply in the practice.
Course description	During the course of Macroeconomics the following issues are analysed: national product, its structure and volume; aggregated supply, aggregated demand and factors influencing them; recession, inflationary phase and business cycles; fiscal and monetary policy and tools and measures for their implementation; unemployment and inflation; economic growth, international trade and its policy.

VVKB17157	MANAGEMENT			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To form systematic logical management perception by providing knowledge about management science and practical skills needed to organize the preparation of managerial decisions and their implementation.			
Course description	During the management course the evolution of management theories is examined, key management functions - planning, organization, leadership, control - the essence and characteristics are disclosed, economic methods of management and their specifics of application, psychological management methods and their role, administrative management methods and their application specifics, management decision support system. The importance of the external environment impact on the organization's management is explained. The most important organizations of competitiveness factors are considered. This will allow to understand basic management principles to master the specifics of the business management, understand the need for systematic management methods.			

VVKB17159	MANAGEMENT			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To form theoretical management knowledge base and to develop capabilities of using acquired knowledge in Management activity situation.			
Course description	During the course the following topics are covered: essence of management, basic concepts and their interpretations, evolution of management theories, cyber management model: subject and object of management. There are analysed organization as a system (systemic view application), types of organizations, elements and environment of organization, establishment of organizations and organization's management types of structures. Also there are analysed functions of management: planning, organizing, leadership and controlling, administrative and economic as well as psychological methods of management, manager role in the system of organization management management's decisions' preparation and adoption of principles, its process,			

	assessment of the job of employees, pay for work and motivation. There are disputed change and conflict management.
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VVVKB17813	MANAGEMENT			3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To form basis of methodological knowledge of the base of theoretical knowledge of management and educate capabilities of professional critical, systematic, constructive thinking.			
Course description	During the course the following topics are covered: essence of management, basic concepts and their interpretations, evolution of management theories, cyber management model: subject and object of management. There are analysed organization as a system (systemic view application), types of organizations, elements and environment of organization, establishment of organizations and organization' management types of structures. Also there are analysed functions of management: planning, organizing, leadership and controlling, administrative and economic as well as psychological methods of management, manager role in the system of organization management management' decisions' preparation and adoption of principles, its process, pay for work and motivation. There are disputed change and conflict management.			

VVVKB17181	MANAGEMENT			3 ECTS
Lectures – 24 hours/semester	Practical works – 12 hours/semester	Consultations – 2 hours/semester	Individual work - 42 hours/semester	
Course aim	To form basis of methodological knowledge of management and educate capabilities of professional logical thinking.			
Course description	During management course contains management substance, basic concepts and their interpretation. The course conveys evolution of management, identified management object and subjects, organisation elements and surroundings, administrative solutions cycle and their phases, economic, psychological, administrative management methods. There are analysed management functions: prognostication, planning, organization, accounting, control and analysis, as well as projecting of management structures and adaptation, leadership, horizontal and vertical communication, employee evaluation, remuneration and motivation, organisation establishment and control.			

VVVKB17163	MANAGEMENT			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To form basis of methodological knowledge for organization management, and educate capabilities to apply an acquired knowledge in examining real professional situations.			

Course description	During the course the following topics are covered: essence of management, basic concepts and their interpretations, evolution of management theories, cyber management model: subject and object of management. There is analyzed organization as a system (systemic view application), types of organizations, elements and environment of organization, establishment of organizations and organization' management types of structures. Also there are analyzed functions of management: planning, organizing, leadership and controlling, administrative and economic as well as psychological methods of management, manager role in the system of organization management, management' decisions' preparation and adoption principles, pay systems and motivation. There are disputed change and conflict management.
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VVKB19814	MARKETING RESEARCH			3 ECTS
Lectures – 24 hours/semester	Practical works – 16 hours/semester	Consultations – 2 hours/semester	Individual work - 38 hours/semester	
Course aim	To get knowledge in contemporary marketing research methods; to get competence in performing marketing research; to perceive advanced and innovative practice in marketing research.			
Course description	Marketing Research is an intensive study subject that allows students to acquire the latest knowledge and develop the ability to independently conduct marketing research in national and international markets, which needs to be based on marketing decisions. Studying marketing research will provide students with up-to-date knowledge of marketing research, including e-market research and the methods used to conduct it, database structures and decision support systems, and target classical common marketing research methods such as surveys: interviews, observation, focus groups, and more. Students will be able to prepare and substantiate research methodology, organize and implement marketing research, correctly describe it.			

VVKB19815	MARKETING RESEARCH COMPLEX PROJECT			6 ECTS
Lectures – N/A	Practical works – 32 hours/semester	Consultations – N/A	Individual work - 128 hours/semester	
Course aim	To provide students with theoretical and practical knowledge about the complex project of marketing research, its preparation parts, and applied methods for marketing research, to provide the abilities related to business excellence in marketing research needed to make data-informed marketing decisions.			
Course description	The Marketing Research Complex project is a written research work designed to deepen, improve, and reveal students' knowledge in the field of marketing research and to acquire the ability to identify the marketing research problem, to apply the methodology to conduct research, organize and conduct marketing research, process and formalize research data, and provide possible solutions.			

VVFRB16601	PRICING			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	Individual work - 96 hours/semester	
Course aim	Be able to formulate price policy and strategy adequate to the business general objectives and choose the justify main solutionsfor business.			
Course description	Pricing discipline deals with instruments (e. g. pricing strategies and methods, data collection, quantitative and qualitative dataprocessing methods, computer technology for addressing pricing issues) which are used in decision making process for effectivepricing. It focuses on pricing factors (e. g. customers, competitors, the organization’s scope and cost, ethics and laws) and theirvaluation particularities, what on specific, but constantly changing market conditions enable to maximize the sustainabledevelopment.			

VVFRB16609	VALUATION OF FINANCIAL INSTRUMENTS			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To provide students with both theoretical and comprehensive knowledge of the various financial and investment instruments, objectives of their use, rising risks and their valuation.			
Course description	The course of Valuation of Financial Instruments analyses risks of variuos financial and invesmnet instruments and their valuation. Risks conected with financial instruments are separated. Big attention is paid to separate investment means such as bonds, stocks, investment funds, exchange traded funds. Invesmnet instruments used by profesional investors, such as derivatives and structural means, investment using borrowed funds are also analysed. Students will lear to evaluate risk of financial instruments. Basic knowledge how to form investment porftolios is presented.			

VVEIM17346	ENGINEERING ECONOMICS			6 ECTS
Lectures – 20 hours/semester	Practical works – 20 hours/semester	Consultations – 10 hours/semester	Individual work - 110 hours/semester	
Course aim	The main aim of module is to introduce master degree students with engineering solutions to the economic evaluation, developing the ability to use financial-economic performance criteria performance of engineering analysis and apply this knowledge in practice.			

Course description	This course is for students which know the basic economic and financial program, so here are formulated problematic, dependent of the current technological developments questions: Is the new technological wave compatible with the current economic rules of the game? Does getting larger and long-term investment requiring technological modernization and unprecedented pace of growth in productive efficiency does not interfere with traditional market mechanisms? Trying to answer similar questions we must to access the main economic technical systems description models. Accounting principles and financial mathematics, alternative comparison theory creates economic analysis assumptions. These theories finding, counting and derived economic criteria in drawing up technical investment, industrial property renovation, depreciation methods of analysis and capital formation principles.
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VVVKM17056	INTERNATIONAL MANAGEMENT (WITH COURSE PROJECT)			9 ECTS
Lectures – 20 hours/semester	Practical works – 20 hours/semester	Consultations – 15 hours/semester	Individual work - 185 hours/semester	
Course aim	To provide knowledge of the contemporary international management and develop abilities to manage theoretical and practical tasks of business internationalisation.			
Course description	International Management course focuses on the challenges and priorities of international management, international management theories and their typology, application of the theories in business practice. Business internationalisation aims, motivation and internationalisation modes, internationalisation paths depending on the company type, international business relations and the principles of their establishment, competition and cooperation in international value chains, application of the international networking theories in different business settings are the main topics covered durring the course.			

VVVKM17288	LEARNING ORGANIZATION (WITH COURSE PROJECT)			9 ECTS
Lectures – 20 hours/semester	Practical works – 20 hours/semester	Consultations – 15 hours/semester	Individual work - 185 hours/semester	
Course aim	To get theoretical knowledge of the Learning organization, its methodological principles, to develop skills of applying theoretical knowledge in practice, allowing to identify conditions and motives for Learning organization, to assess the development of Learning organization and it's economic benefits, to choose models of renewal the learning process in various levels of the organization, to encourage innovative processes.			

Course description	Subject of Learning organization examines the concept of the learning organization, its importance in business and management processes and decision-making, disclosed a learning organization attributes and properties and methods of how to determine whether an organization is learning. Also analyzes issues favorable for the development of a learning environment: recognition of differences, feedback ensuring the promotion of new ideas and recognition of errors. Analysis of the learning process: information acquisition, evaluation and application stages. Much attention is paid to the analysis of learning methods: exploration, research, monitoring, practical learning, reflection, experimentation. This will enable students to understand the basic principles of Learning organization, mastering the techniques specificity and understanding necessity of systematic methods for Learning organization's management.
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VVTVM17152	MANAGERIAL INFORMATION TECHNOLOGIES			6 ECTS
Lectures – 20 hours/semester	Practical works – 10 hours/semester	Consultations – 10 hours/semester	Individual work - 120 hours/semester	
Course aim	To apply modern standards of organizations' activity projections, planning, coordination and implementation, to make an adequate evaluation of organization's state and development opportunities using various scenarios of business management and forming strategies suitable for various organizations' activity development which would allow to minimize the losses of the risk, taking into account the economic, social efficiency of projected activities, innovations and technological progress.			
Course description	Managerial information technology course discovers topics of information and communication technologies, trends and their impact on business, the implementation processes, which creates additional value to the organization, also analyses management aspects of information technology and innovation.			

VVEIB17029	REGIONAL ECONOMICS II: NORDIC COUNTRIES			3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To prepare specialists, which are able in complexity to understand and analyse economic development trends and perspectives in various world regions, specifically in Nordic countries and able to prepare and implement concrete international projects for development of economical relations with this region.			

Course description	Regional Economics II: Nordic Countries course is introducing in details with various economic sectors, culture, science and technology advancement and political development features, also international economic relations specific for Nordic countries. Nordic countries is important world region, which is specifically important for development of international economic relations and cooperation in culture, science and study areas. Prioritised attention is given to perspectives of international trade and investments development, also overall perspectives of region economical potential, economic situation and economic development perspectives, also for studies of regional history, culture and political development topicalities. During the studies, concrete possibilities are analysed, for preparation and implementation of international projects for development of international relations with this region.
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VVVKM17108	STRATEGIC MANAGEMENT			6 ECTS
Lectures – 20 hours/semester	Practical works – 10 hours/semester	Consultations – 10 hours/semester	Individual work - 120 hours/semester	
Course aim	To provide a theoretical background of strategic management and comprehensive understanding of the strategic management process. To provide the knowledge and develop skills to apply strategic analytical tools, which would help to make effective decisions and implement successful actions. To develop practical skills of strategic management.			
Course description	Strategic management course discusses implications of strategic management, business strategy, sources of competitive advantage, relationships between organization and competitive advantage, industry analysis, competition and market niches, competition in concentrated markets, entry in the market and competitive advantage, value creation in value chain, strategic management in changing environment, globalization and strategy, corporation strategy, strategy development process. Taking into consideration the peculiarities of contemporary strategies and analyzing international experience of organizations, the students are acquainted with the main models and tools of strategic management; the role of leadership is discussed; the factors impacting strategy are revealed; the problems and the means how to overcome these problems in order to successfully implement strategy are discussed.			

VVVKM17100	THEORY OF ORGANIZATION			6 ECTS
Lectures – 20 hours/semester	Practical works – 20 hours/semester	Consultations – 10 hours/semester	Individual work - 110 hours/semester	
Course aim	To apply theoretical and practical knowledge of organization theory while making strategic decisions of management, structure and operations, designing situations and predicting actions of competitors, analyzing capabilities of creating a new organization, using elements of strategic thinking and strategic management.			

Course description	The course provides a detailed analysis of organizational theories and their application in organizational management practical situations. There is introduction to the situational approach to the peculiarities of the application of organizational theory, analysing the relationship between the individual, organizational management and its environment. Possibilities of adapting the management structure of the organization in the changing complex environment are discussed: level of specialization, configuration, decision making, delegation of powers, level of formalization. Problems of activity diversification and strategy formation are solved.
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CIVIL ENGINEERING FACULTY

STGGB17268	APPLIED PHYSICS		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 96 hours/semester	
Course aim	To provide theoretical and practical knowledge of building physics - to introduce the building climatology, thermal physics, architectural and building acoustics, natural and artificial lighting bases.		
Course description	Physics building consists of three components: thermal engineering, construction and architectural acoustics, and light engineering. Thermal technology areas examined by the building of partitions choice questions according to their heat and humidity occurring processes and the building exterior and interior climate. Building and architectural acoustics field goal - to select appropriate design solutions to ensure acoustic comfort in the building. Light technical introduction to the field of natural and artificial lighting bases.		

STGGB17030	BASIS OF STRUCTURAL DESIGN		3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work - 33 hours/semester	
Course aim	To provide theoretical knowledge of loads and action and their practical skills to designings buildings and structures. Teach to design stresses combination.		
Course description	Knowledge about the management of the reliability of building and assessment of loads and action during the design of a building.		

STGGB17173	ENGINEERING GEOLOGY		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 33 hours/semester	
Course aim	An understanding of geological processes and their influence in design and construction.		
Course description	Earth structure, composition and origin. Minerals and rocks. Earth's interior and exterior geological processes. Geological structures. Tectonic processes. Development of Earth crust. Clasification of minerals, rocks and soils. Physical and mechanical features of soils. Origin and types of groundwater, physical and chemical properties. Flow of groundwater. Polution of soil and groundwater. Weathering. Eolian processes. Glaciation, deglaciation, related processes and surface forms. Water-erosion (fluvial, karst), seasonal and permafrost processes. Mineral deposits of Lithuania.		

STTMB17042	ENGINEERING MECHANICS		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 96 hours/semester	
Course aim	Get acquainted with general notions of mechanics and with solution methods of statical, kinematical and dynamical problems of rigidbody mechanics. To acquire and assimilate knowledge about behaviour of mechanical objects under action of forces at knownboundary and initial conditions. To understand main fundamental principles of statics and dynamics. To learn solving practicalproblems of mechanics.		
Course description	Object of mechanics. Idealizations. Fundamental axioms, laws and notions of mechanics. Particle, rigid body, mechanical system.Force, couple, moment, link. Forces in 2D and 3D space. Free-body diagram. Equilibrium of particle and rigid body. Distributed loads,gravity centre. Friction. Notions of kinematics. Velocity, speed, acceleration, path. Equations of motion. Kinetics of particle and rigidbody. Differentials equations of motion. Fundamental theorems of kinetics. Fundamentals of analytical mechanics.		

STGGB17195	FOUNDATION ENGINEERING (WITH COURSE PROJECT)		6 ECTS
Lectures – 24 hours/semester	Practical works – 24 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 110 hours/semester	
Course aim	General knowledge about design of various types of foundations: design requirements, rational types of foundations, their basement and dimensions calculations.		

Course description	Foundation design. Analysis of initial design data. Shallow foundations: types, design. Pile foundations: design, principles construction technology. Deep foundations: single bored and bored piles wall. Underpinning. Retaining walls. Environmental problems in geotechnical engineering.
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STGSB17037	HUMAN'S SAFETY		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 33 hours/semester	
Course aim	To provide knowledge on occupational safety legislation and principles of occupational safety and health, occupational hygiene, environmental protection, ergonomics and fire protection.		
Course description	Human safety conception, meaning and tasks. Management of work safety. Legal regulation of human safety. Risk management. Occupational hygiene. Occupational stress and management. Ergonomics, general principles. Electrical safety. Lightning. Static electricity. Fire protection. Evacuation from buildings.		

STGSB17062	HUMAN'S SAFETY AND ENVIRONMENTAL PROTECTION		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 33 hours/semester	
Course aim	To provide knowledge on occupational safety legislation and principles of occupational safety and health, occupational hygiene, environmental protection, ergonomics and fire protection.		
Course description	Human safety conception, meaning and tasks. Management of work safety. Legal regulation of human safety. Man and environment. Atmosphere pollution and protection. Water pollution and protection. Wastes. Risk management. Occupational hygiene. Occupational stress and management. Ergonomics, general principles. Electrical safety. Fire protection. Evacuation from buildings.		

STGSB17174	MATERIALS SCIENCE AND BUILDING MATERIALS		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work - 96 hours/semester	

Course aim	To give the knowledge about meaning of material knowledge, their structure, properties, basic investigations methods, practical use.
Course description	Classification of materials according to the origin and structure. Material composition, structure and properties of the relationship. Materials selection and use. The main characteristics of building materials and their methods. Structural ceramics, glass and glassware. Binders. Concrete and mortar configurations, features and articles. Painting materials. Heat and sound insulating materials. Properties of wood and products from it. Properties of polymers and plastics in use.

STTMB17055	MECHANICS OF MATERIALS		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 96 hours/semester	
Course aim	To give knowledge and acquaint with engineering methods for simple strength and stiffness problems.		
Course description	General principle, hypothesis, assumption, conception. Tension and compression. Geometrical properties of cross sections. Shear. Torsion. Bending. Fundamentals of stress-strain state. Compound stresses. Dynamic and cyclic loading. Understanding of buckling and cracking.		

STTMB17053	MECHANICS OF MATERIALS		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 96 hours/semester	
Course aim	To provide the knowledge and to develop the engineering skills for analyzing strength and stiffness of deformable elements subjected to combined loading and computing skills for analysis of rods subjected to specific effects, to prepare for the studies of structural design.		
Course description	Strength and stiffness of bending beams. Mechanical properties of materials. Compound stresses. Buckling of bar. Deformation from dynamic loading. Cyclic deformation. Fundamentals of fracture theory.		

STTMB17058	MECHANICS OF MATERIALS 2		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 96 hours/semester	

Course aim	To provide knowledge of engineering methods for calculation strength and stiffness of structural elements subjected to compound stresses. To train up the potency of application of these methods by oneself. To develop the potency to analyse the mechanical peculiarities of structural elements under specific loadings. To prepare for the studies of the mechanics of various structures.
Course description	Deflection of beams. Techniques for determining beam displacements. Statically indeterminate beams. States of stress and strain. Strength and plasticity hypothesis. Strength of structural elements under compound stresses. Stresses in a thin-walled pressure vessels. Stress concentration. Contact stresses. Stability of columns. Buckling. Influence of dynamic loadings. Variable stresses. Fatigue. Brittle fracture of cracked elements. Experimental investigations of stress and strain of elements subjected to various loadings.

STGGB17053		MULTI-STOREY BUILDINGS		3 ECTS	
Lectures – 36 hours/semester		Practical works – 12 hours/semester		Consultations – 2 hours/semester	
Laboratory works – N/A			Individual work - 30 hours/semester		
Course aim	Provide theoretical knowledge and practical skills of multi-storey buildings structures analysis constructing and design.				
Course description	Structural aspects of multi-storey buildings structures with fundamental approaches to the analysis of the behavior of different form of buildings structures including frame, shear wall, tubular, core and outrigger-braced systems. Loadings and actions to which the structures are subjected, including the effect of wind forces design decisions, dynamic response of structures subjected to wind forces. Design criteria which are of the greatest relevance to multi-storey buildings, and various structural forms which have developed over the years of engineering practice. Modeling of building structures for analysis and design. Design of structural elements and assemblies.				

STTMB17105		NUMERICAL ANALYSIS OF STRUCTURES - BIM 2		3 ECTS	
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – 2 hours/semester	
Laboratory works – N/A			Individual work - 33 hours/semester		
Course aim	To give knowledge about finite element method. To research design of bar structures displacements and internal forces by finite element method. To give knowledge about solution of various mathematical, mechanical and engineering problems using special software.				

Course description	Assumption of finite element method. Creation of bar structures, tension-compression and bendable finite elements, main dependencies. Stiffness equation and stiffness matrix of element, calculation of their coefficients. Creation of finite element system algebraic equilibrium equations. Algorithm of structure displacements and internal forces calculation; their calculation by PC.
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STGGB17037	REINFORCED CONCRETE STRUCTURES 2		6 ECTS
Lectures – 45 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work - 81 hours/semester	
Course aim	Knowledge about design of reinforced concrete structures by applying calculation methods based on serviceability limit states; types and design peculiarities of over ground bearing structures; structural solutions and design peculiarities of shallow and deep foundations.		
Course description	Cracking and stiffness of reinforced concrete members. Reinforced concrete structures of multi-storey buildings. Reinforced concrete structures of single-storey buildings. Foundation structures.		

STGGB17038	REINFORCED CONCRETE STRUCTURES 2 (COURSE PROJECT)		3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work - 48 hours/semester	
Course aim	To provide knowledge and ability to design reinforced concrete elements: foundations, columns, slabs.		
Course description	Design and construction of reinforced concrete elements: foundation, column, slab.		

STVNB17303	TECHNOLOGY OF CONSTRUCTION PROCESSES		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work - 96 hours/semester	
Course aim	Providing information on construction technology and developing skills of practical application of the acquired knowledge.		

Course description	Knowledge on technology of construction processes is provided; construction phases, approaches and processes are analysed. The module covers topics as follows: - technology of construction processes and its relationship with other disciplines, evolution of construction in Lithuania and its future; - types of piles and deepening forms, hammering piles and ensuring their quality, installation of wringing pits, works with moulds; reinforcement forms, their connection principles, their products, reinforcement of not tightened constructions, tightening of reinforcement, reinforcement of prestressed constructions, production of, feeding of concrete mix to falsework and consolidation of concrete mix.
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STGGM17124	DURABILITY AND PROBABILITY ANALYSIS OF BUILDING STRUCTURES		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work - 115 hours/semester	
Course aim	To train students to analyze, evaluate and forecast durability of construction works. To train students to determine reliability of safety and serviceability of members in design and in evaluation of members in service.		
Course description	Concept of durability, its parameters. Corrosion of concrete, masonry, metal (reinforcement) and reinforced concrete, destruction of organic materials, protection of structures in aggressive environment. Forecast of working life for structures. Analysis of regulated reliability and application of it as criterion in design and evaluation of members.		

STMEM17148	COMPUTER AIDED DESIGN OF BRIDGES AND SPECIAL STRUCTURES (BIM) (WITH COURSE PROJECT)		9 ECTS
Lectures – 15 hours/semester	Practical works – N/A	Consultations – N/A	
Laboratory works – 45 hours/semester		Individual work - 180 hours/semester	
Course aim	To teach to apply computers programs to design specific structures.		
Course description	Modern software packages for structural analysis, their abilities, advantages and disadvantages: STAAD (basis program) and one in choice: Lira, Midas, Sofistik, Robot.. Acquisition of command of different programs. Preparation of models for analysis of beam and continuum structures, preparation of initial data for analysis, automation of modeling. Modeling particularities of traffic, wind, soil and hydrostatics actions. Influence lines. Regulation of internal forces. Design (check, select) of steel structures, calculation and design of reinforced concrete structures; automated preparation of designs. Calculation of vibrations modes and forced vibrations. Buckling of structures. Design of bridges, towers, reservoirs, hydraulic structures etc. Distribution transversal of charges with program Tiltai-2000.		

STTMM17132		MECHANICS OF CONTINUAL STRUCTURES		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – N/A
Laboratory works – N/A			Individual work - 115 hours/semester	
Course aim	To explain mathematical models of structures on elastic basement. General theory of continual structures (plates, shells) stress strain design subjected by external loading.			
Course description	General information of curved surface theory. Generalized surface stress and strain state structural member. Main equations of geometrical linear and nonlinear structures in curvilinear coordinate system. Design models and algorithms for various types of shells. Structure on deformable soil design theory. Mechanical models for basement and mathematical equations. Extreme energy principles and mathematical models. Calculating algorithms of structures on deformable basement.			

STMEM17150		STRUCTURES FOR COMPOSITE STEEL AND CONCRETE BUILDINGS		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – N/A
Laboratory works – N/A			Individual work - 115 hours/semester	
Course aim	Student will understand main peculiarities of behavior and design of steel - concrete composite structures.			
Course description	Scope, definition, utilization and efficiency of composite structures, materials and properties. Stress - strain state of composite members and methods of its analysis. Peculiarities of behavior and design of composite structural members and joint connections.			

CREATIVE INDUSTRIES FACULTY

KIFSA17003	PHILOSOPHY			3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	The course is intended to introduce students to the basic problems of philosophy and to provide with skills for critical thinking.			
Course description	The course examines the origin of philosophy and the role of philosophy in the development of European cultural history. Course presents the topics of being, the nature of things and ideas, knowledge, the relationship between science and philosophy, the human place in cosmos, in a society and in the state. The main focus is placed upon antique philosophy and its subsequent interpretations.			

KIKOB18601	ADVERTISING (WITH COURSE WORK)			6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	Individual work - 111 hours/semester	
Course aim	Acquaint with objective of advertisement, its history, forms, ways of application, integration with other communication activities, tendencies, creation, evaluation of effectiveness, peculiarities of analysis data.			
Course description	Basics of Advertisement module is complex and covers theoretical, practical, creative activities which refers to holistic approach and form contemporary understanding of advertising as a organizational tool of communication.			

KIKOB20102	DIGITAL COMMUNICATION			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	Individual work - 96 hours/semester	
Course aim	The main aim of the course is to provide students with a comprehensive understanding of how digital technologies and the rise of social media are changing communication and marketing strategies across different industries. This includes learning about marketing concepts that are relevant in the digital environment, analysing best practice examples, and developing skills for creating, delivering and communicating value by using digital communication tools and social media platforms.			
Course description	The course provides balanced and well-designed training in the principles of digital and social marketing communication. The syllabus is a combination of theoretical knowledge and practical skills. By the end of this course, the students will be able to understand the core processes of planning a digital marketing strategy by employing the major online channels.			

KIKOB17077	INTEGRATED PROJECT			9 ECTS
Lectures – 15 hours/semester	Practical works – 60 hours/semester	Consultations – 6 hours/semester	Individual work - 159 hours/semester	
Course aim	Provide students with practical knowledge and to integrate the knowledge of management, communication and creative industries gained in other courses, through the implementation of the practical project coordinated by the tutors.			
Course description	Course of Comprehensive Project is constructed to gain practical skills as well as to apply and to integrate theoretical knowledge of creative industries, communication, management in planning and execute comprehensive project in the field of creative industries.			

KILSB18002	Lithuanian Language 2 (for Foreign Students)			3 ECTS
Lectures – N/A	Practical works – 32 hours/semester	Consultations – N/A	Individual work - 48 hours/semester	
Course aim	Learning the basics of listening, reading, writing, interacting, and understanding information in Lithuanian in typical academic, cultural and social situations.			
Course description	Topics: food and purchases, at the store, at the café, at the restaurant, and at someone's home. Lithuanian economy and finances. Connections between studies and language. Service culture in Lithuania. Architecture of Vilnius. Lithuanian news and current events. Health and relaxation. At the doctor's. Parts of the body. The health industry in Lithuania. Houses, apartments, and furniture. How to rent an apartment? Lithuanian folklore: aphorisms and sayings. The best known objects and most-visited places in Lithuania. How to show agreement or disagreement. Travel and tourism in Lithuania. Free time. Famous Lithuanian musicians and artists. Sports in Lithuania. Basketball players and teams. The Lithuanian education system.			

KIKOB18202	MASS COMMUNICATION (WITH COURSE WORK)			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	Individual work - 96 hours/semester	
Course aim	The course aims to familiarize with the classical and modern theories of mass communication, a review of the most important means of mass communication theories and methodological problems studied. Historical development of mass communication theories overview.			

Course description	To introduce the mass communication theories, their problems, old and new media, and their interaction. Understand what separates and share new media with the old, the traditional media. Find out what are the signs of new media and how it changes the traditional concepts of mass communication; new media as part of a research in mass communication research field. Coursework consists of theoretical-descriptive and critical, analytical parts (estimated at 33.3 percent.). The student chooses one of mass communication theory, it describes from the scientific literature, and later analyzed on the basis of the theory of criticism in the scientific literature and provide the overall picture, as far as theory is relevant today as it has changed, what can be studied on the basis of the theory today.
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KIPIB17081	MEDIA PROJECTS			6 ECTS
Lectures – 24 hours/semester	Practical works – 24 hours/semester	Consultations – 4 hours/semester	Individual work - 108 hours/semester	
Course aim	To introduce activities of media projects, its practice and application methods in various organizations. To get knowledge in differentiation of project types and applicable project management tools, instruments and methods. To get knowledge about effective project preparation and management tools.			
Course description	Project management basics. Project characteristics. Specifics of media projects. Media as project objectives. Project as temporary organization. Project and non project activity. Project types. Environment analysis tools. Formation of project objectives. Project management instruments and methods (planning, network diagram, critical path, Gantt diagram, milestone plan, recourse allocation). Management of innovative project teams. Design of project organization. New product development projects. Project manager and leadership. Project cycle and management. Project risk assesment methods and tools. Project budget and financial engineering. Preparation of European Union and other international organization financed projects.			

KIPIB19802	ORGANISATIONAL CULTURE			3 ECTS
Lectures – 12 hours/semester	Practical works – 24 hours/semester	Consultations – 2 hours/semester	Individual work - 42 hours/semester	
Course aim	To get acquainted with the concepts and models of organisational culture, its creation and communication; the characteristics of successful cases and their mindset and behavior, and to test knowledge in practice.			

Course description	During the Organizational Culture course, students will learn about theories, models, and practices of organisational culture, change communication, and organizational image. Students will discuss the communication processes and characteristics of a successful organisation: values, models, habits and traditions, specifics of encountering different cultures. The course analyzes models for classifying organizational cultures (G.Hofstede, K.S. Cameron and R.E. Quinn et al.), Methods for identifying and evaluating organizational cultures, communication solutions for innovation, technology, creativity, digital, decentralized, and other types of organizational cultures. The course will analyze cases from global organizations where organizational culture is an important factor for success and exclusivity. Practical skills to use organisational culture identification, creation and communication tools are developed, communication projects for practical real-life situations will be developed.
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KIFSB17109	PHILOSOPHY			3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	The course is intended to introduce students to the basic problems of philosophy and to provide with skills for critical thinking.			
Course description	The course examines the origin of philosophy and the role of philosophy in the development of European cultural history. Course presents the topics of being, the nature of things and ideas, knowledge, the relationship between science and philosophy, the human place in cosmos, in a society and in the state. The main focus is placed upon antique philosophy and its subsequent interpretations.			

KIFSB17107	PHILOSOPHY			3 ECTS
Lectures – 8 hours/semester	Practical works – 4 hours/semester	Consultations – 2 hours/semester	Individual work - 66 hours/semester	
Course aim	The course is intended to introduce students to the basic problems of philosophy and to provide with skills for critical thinking.			
Course description	The course examines the origin of philosophy and the role of philosophy in the development of European cultural history. Course presents the topics of being, the nature of things and ideas, knowledge, the relationship between science and philosophy, the human place in cosmos, in a society and in the state. The main focus is placed upon antique philosophy and its subsequent interpretations.			

KIKOB17065	PUBLIC RELATIONS			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	Individual work - 96 hours/semester	

Course aim	To train in-depth understanding of principles of public relations, to develop basic communications with publics and media skills, to present theoretical and practical basis of public relations along with its problematic, application and tendencies.
Course description	Public relations course consists of theoretical part in which the students will be introduced with fundamental concepts of public relations, its history, formation, strategies and tactics of public relations, planning and evaluation; and practical part in which students will perform individual and group real life public relation practice illustrating tasks. In this course students should learn how to identify and to communicate with various publics, to analyze and to organize public relations campaigns and media relations, as well as to integrate social media.

KIKOB18402	QUALITATIVE RESEARCH (WITH COURSE WORK)			6 ECTS
Lectures – 8 hours/semester	Practical works – 4 hours/semester	Consultations – 4 hours/semester	Individual work - 144 hours/semester	
Course aim	To get knowledge and skills necessary for doing qualitative research.			
Course description	Course creates possibility for students to get acquainted with theoretical presumptions of qualitative research methods, to find out purpose and specifics of qualitative research, to get acquainted with data collection in qualitative researches. Students perform qualitative research: prepare research programme, perform interviews and focus group discussions. Students prepare research report - course-paper. Students have to demonstrate ability to choose appropriate research methods, to perform the research and to interpret and present research findings.			

KIUSA17005	SPECIALITY ENGLISH LANGUAGE			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To help students acquire and develop linguistic and professional communicative skills as well as relevant knowledge so that the future specialists are able to use their acquired competences and analyse information, communicate in spoken and written language in their everyday, academic and Professional situations.			
Course description	The Speciality English Language course is targeted at students of the Faculty of Architecture with the B2 level of English. The course is designed to help students to master the Speciality English Language which would enable them to effectively communicate in English in any professional situation both in oral and written forms. Special skills and general abilities are developed through speciality topics presented in the course. After acquiring communicative (reading, writing, listening and speaking), cognitive, general and intercultural competences, students are able to successfully apply them while searching for specific information or while adapting to international market.			

KIUSB17129	SPECIALITY ENGLISH LANGUAGE 1			3 ECTS
Lectures – N/A	Practical works – 45 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To help students acquire and develop linguistic and professional communicative skills as well as relevant knowledge so that the future specialists are able to use their acquired competences and analyse information, communicate in spoken and written language in their everyday, academic and Professional situations.			
Course description	The course is targeted at students of Business Management Faculty with a B1-B2 level of the English Language knowledge and skills, and who seek to gain professional language skills to communicate more effectively in English in daily and in Professional situation on topics covered in the list. During the course, students develop the independent user's (B) language skills: reception (listening and reading comprehension), production and interaction (speaking and writing), and mediation (translation). Students also master basic professional vocabulary, gain knowledge of the correct technical and scientific language usage, develop skills in analysing the speciality literature.			

KIUSB17146	SPECIALITY ENGLISH LANGUAGE 2			3 ECTS
Lectures – N/A	Practical works – 45 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To help students acquire and develop linguistic and professional communicative skills as well as relevant knowledge so that the future specialists are able to use their acquired competences and analyse information, communicate in spoken and written language in their everyday, academic and Professional situations.			
Course description	The course is targeted at the development of Business Management Faculty students' C1 level of the English Language competences, for further development of skills gained in the course Speciality English Language 1 for communication in both daily and Professional situations. The course develops the independent user's language skills, professional vocabulary, the correct technical and scientific language usage knowledge, abilities to analyse and summarize speciality literature, effective academic presentation skills.			

KIUSB17116	SPECIALITY ENGLISH LANGUAGE			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To help students acquire and develop linguistic and professional communicative skills as well as relevant knowledge so that the future specialists are able to use their acquired competences and analyse information, communicate in spoken and written language in their everyday, academic and Professional situations.			

Course description	The course is targeted at the development of Civil Engineering, Architectural Engineering, Construction Technology and Management students' C1 level of the English Language competences, for further development of skills gained in the course English Language for communication in both daily and professional situations. The course develops the independent user's language skills, professional vocabulary, the correct technical and scientific language usage knowledge, abilities to analyse and summarize speciality literature, effective academic presentation skills.
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KIUSB18110	SPECIALITY ENGLISH LANGUAGE			3 ECTS
Lectures – N/A	Practical works – 45 hours/semester	Consultations – 2 hours/semester	Individual work - 33 hours/semester	
Course aim	To help students acquire and develop linguistic and professional communicative skills as well as relevant knowledge so that the future specialists are able to use their acquired competences and analyse information, communicate in spoken and written language in their everyday, academic and professional situations.			
Course description	The module Speciality English Language is targeted at the development of Creative Industries and Entertainment Industry students' C1 level of the English language competences, for further development of skills gained in the module English for Creative Communication for communication in both daily and professional situations. The course develops the independent user's language skills, professional vocabulary (through media topics), the correct technical and scientific language usage knowledge, abilities to analyse and summarize speciality literature, effective academic presentation skills.			

KIUSB17185	SPECIALITY ENGLISH LANGUAGE			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To help students acquire and develop linguistic and professional communicative skills as well as relevant knowledge so that the future specialists are able to use their acquired competences and analyse information, communicate in spoken and written language in their everyday, academic and Professional situations.			
Course description	The course is targeted at the development of Electronics Faculty students' C1 level of the English Language competences, for further development of skills gained in the course English Language for communication in both daily and Professional situations. The course develops the independent user's language skills, professional vocabulary, the correct technical and scientific language usage knowledge, abilities to analyse and summarize speciality literature, effective academic presentation skills.			

KIUSB17119	SPECIALITY ENGLISH LANGUAGE			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – 2 hours/semester	Individual work - 48 hours/semester	

Course aim	To help students acquire and develop linguistic and professional communicative skills as well as relevant knowledge so that the future specialists are able to use their acquired competences and analyse information, communicate in spoken and written language in their everyday, academic and Professional situations.
Course description	The course is targeted at the development of Environmental Engineering Faculty students' C1 level of the English language competences, further development of skills gained in the course English language for communication in both daily and professional situations. The course develops the independent user's language skills, professional vocabulary, the correct technical and scientific language usage knowledge, abilities to analyse and summarize speciality literature, effective academic presentation skills.

KIUSB17123	SPECIALITY ENGLISH LANGUAGE			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To help students acquire and develop linguistic and professional communicative skills as well as relevant knowledge so that the future specialists are able to use their acquired competences and analyse information, communicate in spoken and written language in their everyday, academic and Professional situations.			
Course description	The course is targeted at the development of Mathematics in Modern Technologies students' C1 level of the English Language competences, for further development of skills gained in the course English Language for communication in both daily and professional situations. The course develops the independent user's language skills, professional vocabulary, the correct technical and scientific language usage knowledge, abilities to analyse and summarize speciality literature, effective academic presentation skills.			

KIUSB17188	SPECIALITY ENGLISH LANGUAGE			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To help students acquire and develop linguistic and professional communicative skills as well as relevant knowledge so that the future specialists are able to use their acquired competences and analyse information, communicate in spoken and written language in their everyday, academic and Professional situations.			
Course description	The course is targeted at the development of Mechanics Faculty students' C1 level of the English Language competences, for further development of skills gained in the course English Language for communication in both daily and Professional situations. The course develops the independent user's language skills, professional vocabulary, the correct technical and scientific language usage knowledge, abilities to analyse and summarize speciality literature, effective academic presentation skills.			

KIUSB17152	ENGLISH LANGUAGE			3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – 2 hours/semester	Individual work - 48 hours/semester	
Course aim	To help students develop linguistic and communicative skills, acquire knowledge according to CEFR B2 - C1 level in order to communicate spontaneously both in written and spoken forms on daily, cultural and professional topics.			
Course description	The course covers an important aspect of academic language study relevant to all subject areas. The aim of the course is to reach a high (B2-C1) level of English to study in an academic institution. The course is aimed at the first-cycle students with B1-B2 level of English. The integrated skills course will develop students' reading, writing, listening and speaking skills in an academic context. It will enable students to prepare assignments, write a research paper in English.			

KIPIB18602	URBAN STUDIES			3 ECTS
Lectures – 4 hours/semester	Practical works – 8 hours/semester	Consultations – 2 hours/semester	Individual work - 66 hours/semester	
Course aim	The aim of the course is to introduce students to the basic concepts of the urban studies and to the recent debates on the principles of urban development and cultural urban planning, to develop abilities to analyze urban spaces and to develop and launch collective projects in creative communication.			
Course description	The course analyzes the city as a creative field of communication, examines the creative concept of the city - a new model of urban regeneration and development globalization. The principles of field research are taught. The course consists of theoretical and practical parts. During the course, students are introduced to the interventions and creative potential of the city's public spaces - from the point of view of the creative industries and entertainment industry, practical creative activations take place. Subject trends and model of cultural heritage and creative tourism, analysis of practical creative possibilities. At the end of the course, a creative project is created.			

KIKOB18401	VISUAL COMMUNICATION (WITH COURSE WORK)			6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	Individual work - 96 hours/semester	
Course aim	In this module students will learn about complexity of visual communication theory: semiotics (formation of content in visual message), psychology of Art (visual perception and perceptual mechanism), and communication (general principles of social communication). In parallel they will gain some understanding in methods of message visualization and rhetoric, the graphic design tools and ways to send a visual message to a target audience. During practical work students apply the knowledge in semio.			

Course description	In this module students will learn about complexity of visual communication theory: semiotics (formation of content in visual message), psychology of Art (visual perception and perceptual mechanism), and communication (general principles of social communication). During practical work students will apply the knowledge in methods of message visualization and rhetoric, the graphic design tools and ways to send a visual message to a target audience.
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ELECTRONICS FACULTY

ELEIB16661	AUTOMATIC CONTROL DEVICES AND SYSTEMS		6 ECTS
Lectures – 45 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 96 hours/semester	
Course aim	Gain knowledge of principles, structure, elements and applications of automatic control devices and systems, acquire skills in experimental investigation of control systems.		
Course description	Principles of automatic control. Linear, nonlinear, pulse and adaptive automatic control systems. Theory, construction, operation and application of electronic, electromechanical, hydromechanical and pneumatic control systems.		

ELEIB16562	AUTOMATIC CONTROL SYSTEMS (WITH COURSE PROJECT)		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 96 hours/semester	
Course aim	Provide knowledge about design and analysis strategies of automatic control systems, design controllers matching specifications of closed loop control system, acquire ability to apply those for control of various dynamic systems and be able to use advanced informational technologies for assessment results of automatic control systems synthesis and analysis.		

Course description	Automatic control theory provides knowledge about design strategies of automatic control systems: open loop and closed loopsystems, disturbance compensating systems and feedback control systems, the basis of mathematical models of systems:differential equations of linear systems, analysis in time domain, Laplace transform, transfer functions and stability analysis infrequency domain (Mikhailov, Nyquist methods) and Bode diagrams; and knowledge, required for system synthesis: principles ofdesign proportional, integral, integral proportional and proportional integral derivative controllers and compensating elements;knowledge about modeling of transient processes using MATLAB software.
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ELKRB16404	COMPUTER ENGINEERING PRACTICUM		3 ECTS
Lectures – N/A	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 30 hours/semester		Individual work - 48 hours/semester	
Course aim	The aim of this course is to understand the operation of semiconductor devices, to design electronics circuits and printedcircuit boards, to perform assembly, testing and research of these printed circuits boards.		
Course description	Computer engineering practicum delivers knowledge and practical skills about circuit schematic component and footprintlibrary creation, circuit schematic design, printed circuit board design, soldering and assembling, and about advancedprinted circuit board design.		

ELKRB16201	COMPUTER LOGIC		3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work - 48 hours/semester	
Course aim	To acquaint students' with basic concepts of computer logic and develop ability to solve typical problems of discrete mathematics.		
Course description	Propositional Calculus, Truth Table, Logical Circuits, Predicate Calculus, Predicate and Quantifiers, De Morgan laws, Statements with Quantifiers, Elementary Number Theory, Proof Theory, Methods of Proof, Contradiction and Contraposition, Algorithms, Sequences, Mathematical Induction, and Recursion, Correctness of Algorithms, Recursion of Sequences, Set Theory, Operations on Sets, Boolean Algebras, Russell's Paradox, Efficiency of Algorithms, Analysis of Algorithms' Complexity.		

ELESB16604	COMPUTER NETWORKS		6 ECTS
Lectures – 45 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	
Course aim	The aim of the subject is to acquire knowledge on the computer network fundamentals, acquire the abilities to describe structure, architecture and operation of computer networks, to investigate topology and function of a network, to plan and develop a computer network, carry out the tasks of network administration.		
Course description	Subject focuses on common OSI model, principles of data exchange (communication medium, data coding, data transmission interface, control of the data transmission channel, data compression). The protocols of the computer network are reviewed (the protocols of interaction between computer networks, transport protocols). The term LAN is introduced, the LAN technology, LAN systems are analyzed in this subject. The term WAN is introduced, the channel switching, packet switching technologies, ATM and Frame Relay protocols are analyzed. The subject also focuses on the security of the computer network, distributed computer network systems, tools for computer network administration.		

ELKRB16617	COMPUTER PERIPHERALS		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 33 hours/semester	
Course aim	Learn to develop, improve and apply the modern tools of communication and interaction between computers and various hardware components, so that they can exchange data, communicate with each other and send messages and commands, develop the ability to apply the acquired knowledge in engineering practice.		
Course description	In the Computer Peripherals subject knowledge about data communication principles, data communication systems and their characteristics, protocols and protocols architecture, interfaces for PC and peripheral devices, data encoding and modulation techniques, serial data interfaces, microcontroller interfacing techniques, IrDA and Bluetooth technology, modems and power supply units is provided.		

ELKRB16202	DATABASES		3 ECTS
Lectures – 15 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 48 hours/semester	
Course aim	To understand the physical, conceptual and logical database (DB) organization. Learn to design relational DB and their support, learn relational algebra and relational computing language SQL.		

Course description	In Databases course the main database (DB) design phases, the canonical schemes and principles of their creation and use are presented. The focus is on the management of relational databases. Briefly discussed the models of DB logical structure, operations of relational algebra and the SQL language, used for their description. The design of relational databases is trained. Self-sufficiency and responsibility during studying, the thoroughness of work and time planning is trained.
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ELEIB16252	ELECTRICAL ENGINEERING		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 96 hours/semester	
Course aim	Provide knowledge about linear direct current circuits, single-phase alternating current circuits and three-phase circuits; develop the ability to apply the acquired knowledge in engineering activities; acquire the experience of practical investigation, develop the abilities to analyze electric circuits; develop the abilities to analyze electric circuits using computer; acquire the ability to work individually and in group.		
Course description	Basic concepts of electrical circuits. Direct current circuits laws, algebraic methods for circuit analysis. Circuit's properties, characteristics, change. One-ports. Sinusoidal electric values, main characteristics, phasors diagrams. Idealized circuit elements. Series and parallel connection of elements. Voltage and current resonances. Analysis of sinusoidal electric circuits. Alternating circuit power. Energy Supply. Mutual inductance circuits. Three-phase circuits: connection modes, analysis.		

ELEIB16251	ELECTRICAL ENGINEERING		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 96 hours/semester	
Course aim	Provide knowledge about linear direct current circuits, single-phase alternating current circuits and three-phase circuits; develop the ability to apply the acquired knowledge in engineering activities; acquire the experience of practical investigation, develop the abilities to analyze electric circuits; develop the abilities to analyze electric circuits using computer; acquire the ability to work individually and in group.		
Course description	Basic concepts of electrical circuits. Direct current circuits laws, algebraic methods for circuit analysis. Circuit's properties, characteristics, replacing. Two-ports. Sinusoidal electric values, main characteristics, phasors diagrams. Idealized circuit elements. Series and parallel connection of elements. Voltage and current resonances. Analysis of sinusoidal electric circuits. Alternating circuit power. Energy Supply. Mutual inductance circuits. Three-phase circuits: connection modes, analysis.		

ELEIB16403	ELECTRICAL ENGINEERING		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 33 hours/semester	
Course aim	Provide knowledge about linear DC, AC single-phase and three-phase circuits, transients in linear DC and AC circuits, magnetic circuits. Develop the ability to experimentally investigate and develop these circuit using various methods.		
Course description	Basic circuit concepts. DC circuit laws, algebraic circuit analysis. Sinusoidal electrical quantities. Idealized circuit elements. Sequential and parallel circuit elements. Resonance phenomena. Sinusoidal AC circuit analysis. Sinusoidal AC power circuits. Transition Processes, magnetic circuits.		

ELESB16401	ELECTRONIC DEVICES		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work - 48 hours/semester	
Course aim	Providing knowledge of mathematics and physics and ability to apply knowledge in design and optimization of electronic devices. Providing knowledge of modern electronic devices and their applications in various fields of science and technology. Preparation for further studies of electronic circuits and other subjects.		
Course description	Introduction. Semiconductor diodes. Bipolar transistors. Field effect transistors. Thyristor devices. Semiconductor integrated circuits technology. Bulk and surface acoustic wave devices. Optoelectronic devices. Display devices. Summary.		

ELEIB16201	ELECTRONICS AND ELECTRICAL ENGINEERING		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 33 hours/semester	
Course aim	To master basic laws of electronics and electrical engineering, principles of working of electrical and electronics devices and equipment's, to develop abilities for the independent decision of electrical engineering questions, to understand principles of work digital electronics devices and areas of their application.		

Course description	Circuits of a direct current. Circuits of an alternating current. Circuits of a single-phase and three-phase current. Transient processes. Transformers. Electrical machines. Electric drives of technological devices and their management. Elements of electronics. p-n junction. Diodes. Transistors. Rectifiers of an alternative current. Electronic amplifiers. A structure of digital devices, gauges and converters, the circuits and a principle of action of memory and microprocessors, features of their application in technologies. Control of devices by digital methods.
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ELEIB16651	HUMAN SAFETY		3 ECTS
Lectures – 15 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 48 hours/semester	
Course aim	To provide knowledge about legal - normative work safety organization principles, electric current hazard criterias and safety measures, work environment design key indicators, occupational risk assessment aspects, accident investigation and accounting, firesafety organization principles, to apply the acquired knowledge in solving engineering management issues, to develop broad expertise, to have an ability to critically analyze and develop creative solutions for professional challenges.		
Course description	Introduction to the subject matter of the issues. The legal protection of people - a legislative regulation. Safety of human activities. Risks and their classification. General work safety. Occupation safety. Electrical protection. Accident investigation Features.		

ELEIB16861	INDUSTRIAL LOGICAL CONTROLLERS		3 ECTS
Lectures – 24 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 12 hours/semester		Individual work - 42 hours/semester	
Course aim	Gaining theoretical and practical knowledge about modern programmable logic controller types, structure, programming and application of automated systems and mechatronic systems.		
Course description	PLC definition, design, structure, operation, software tools and the structure of the programming components, the IEC 61131 standard programming language.		

ELKRB16822	INTERNET TECHNOLOGIES		3 ECTS
Lectures – 24 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 12 hours/semester		Individual work - 42 hours/semester	
Course aim	To learn to develop, improve and apply the decisions based on Internet technologies as in information systems of a general purpose, and specialized systems with the WEB-interface, about also to be able is given reason to prove decisions, working independently and in group.		
Course description	At studying a Internet technologies subject are acquired knowledge of the basic protocols of TCP/IP stack, of WEB-technologies (static, dynamic, and active WEB-documents), technologies of transfer of files, e-mail, p2p-networks, security of networks, access to a Internet network, commercial use Internet.		

ELESB16612	MICROCONTROLLERS SYSTEMS		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work - 96 hours/semester	
Course aim	To provide students with sufficient knowledge of microcontroller architecture and programming and to develop the ability to apply that knowledge in engineering activities. To develop the need to seek for the knowledge of programming of embedded systems. To develop the ability to maintain their professional competence by life-long learning.		
Course description	The study module of microcontroller systems provides knowledge about 8 and 32 bit microcontrollers. The architecture of microcontrollers is discussed in details: kernel, registers, memory types, general purpose and specific pins, interrupts, timers-counters, analog to digital converters. The communication interfaces are also presented in details. The programming of peripheral devices such as sensors, displays, external memories, is discussed.		

ELKRB16612	MICROPROCESSORS		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work - 96 hours/semester	

Course aim	To provide students with sufficient knowledge about general and special purpose microprocessors, to develop the need to be interested in microprocessor systems programming, to develop the ability to apply the acquired knowledge in engineering practice and to develop the ability to maintain their professional competence through lifelong learning.
Course description	In the microprocessors course knowledge about microprocessor systems, their creation principles and architectures, concepts of microprocessors, general and special purpose microprocessors structures, their operation principle, data and instruction formats, operand addressing modes, memory organization, instruction set, and modern microprocessors technologies are provided.

ELKRB16823		MICROTECHNOLOGIES		3 ECTS
Lectures – 24 hours/semester		Practical works – N/A		Consultations – 2 hours/semester
Laboratory works – 12 hours/semester			Individual work - 42 hours/semester	
Course aim	Teach to understand, analyze and simulate processes of microtechnologies and develop skills to choose a reasoned decision, an independent or in group.			
Course description	Acquiring knowledge of the key technological processes for embedded computers(EC) and systems manufacturing technologies: methods of formation geometry components by lithographies and wet and dry removal processes, doping an deposition, interconnection and packing technologies, challenges of microtechnologies and future features and developed abilities to analyze and simulate microtechnology processes and EC elements.			

ELKRB16613		MICROWAVE TECHNOLOGY		3 ECTS
Lectures – 30 hours/semester		Practical works – N/A		Consultations – 2 hours/semester
Laboratory works – 15 hours/semester			Individual work - 33 hours/semester	
Course aim	To soak up peculiarities of microwave band, pick up to design antennas, microwave transmission lines with due properties, make reasoned solutions on one’s own and with group.			
Course description	Microwave technologies subject gives knowledge about propagation of radio waves around Earth surface, elementary and real antennas, microwave transmission lines.			

ELESB16801	MULTIMEDIA SYSTEMS		3 ECTS
Lectures – 24 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 12 hours/semester		Individual work - 42 hours/semester	
Course aim	The aim of this subject is to acquire knowledge about the fundamentals of the multimedia systems, its design, analysis and applications. Educate the cognitions to combine theory and practice to develop and analyse innovative multimedia systems.		
Course description	In this subject the innovative multimedia systems are presented. The subject begins with discussion on the multimedia systems evolution, short review of the innovative multimedia devices and new standards. The human hearing systems is reviewed, its relations with innovative audio processing, storage, transmission and restoration. Innovative digital audio and video technologies are presented and new tendencies of the audio technology are discussed.		

ELEIB16206	SMART ELECTRICAL AND ELECTRONICS SYSTEMS OF BUILDINGS		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work - 33 hours/semester	
Course aim	Provide electrical engineering knowledge, develop the ability to creatively analyse and solve electrical issues.		
Course description	Direct current circuits. Alternating current circuits. Circuits of a single-phase and three-phase current. Transformers. Electronic components and equipment. Electrical machines. Electric drives of technological devices and their control equipment. Protection against electric.		

ELEIM17201	CONTROL OF ELECTRICAL ENERGY SYSTEMS		6 ECTS
Lectures – 42 hours/semester	Practical works – N/A	Consultations – 3 hours/semester	
Laboratory works – N/A		Individual work - 115 hours/semester	
Course aim	Provide knowledge about control of electrical systems, elevate the practical skills to select and calculate the components of the electrical systems, optimize the power flow in electrical energetics systems.		
Course description	Module covers the theory of the control of the electrical systems, system operation mode planning, respective reglaments and standards, the power flow distribution tasks are overviewed and the skills to practically determine and select the electrical system components, based on the analytical and mathematical modelling are developed.		

ELEIM17204	ELECTRONIC CONVERTERS (WITH COURSE PROJECT)		9 ECTS
Lectures – 42 hours/semester	Practical works – 15 hours/semester	Consultations – 3 hours/semester	
Laboratory works – N/A		Individual work - 180 hours/semester	
Course aim	To acquire the knowledge and competence in electronic converters, planning, design and operation.		
Course description	Principle of operation of electronic converters, analysis and design energy systems are described.		

ELEIM17400	MASTER GRADUATION THESIS		30 ECTS
Final thesis - 800 hours/semester			
Course aim	To finish and present final work with the research elements, proving, that during study and scientific research the competence and abilities meet the requirements of a qualifying degree of the master.		
Course description	Completion of theoretical and experimental parts of Master Thesis. Generalization of the results received. Analysis and generalization of the results. Preparation of the material of a report for a scientific conference (or a paper for a scientific journal). Preparation and defence of the prepared Master Thesis in order to substantiate that the obtained knowledge, experience and competence correspond to the Electrical Engineering Master level. (The prepared conference report or paper must be presented in an appendix to the Master thesis).		

ELEIM17203	MODERN ELECTRICAL ENGINEERING		6 ECTS
Lectures – 42 hours/semester	Practical works – N/A	Consultations – 3 hours/semester	
Laboratory works – N/A		Individual work - 115 hours/semester	
Course aim	To acquire the knowledge and competence in modern electrical engineering, analysis, design and operation of modern electric systems.		
Course description	In Modern electrical engineering discipline students gain knowledge in principles of operation of modern electrical engineering equipment and smart electric grids, analysis and design.		

ENVIRONMENTAL ENGINEERING FACULTY

APAVB19403		ATMOSPHERE PROTECTION (WITH COURSE WORK)		6 ECTS	
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester			Individual work – 96 hours/semester		
Course aim		To gain a theoretical knowledge on atmosphere pollution control and reduction methods; to formulate professional skills for independent work with air pollution control and air cleaning from solid particles and chemical pollutants equipment, permitting to analyze professionally air pollution and to apply pollution reduction measures.			
Course description		Study subject acquired knowledge about sources of air pollution, situations and trends in Lithuania and in other countries, solid particles, their chemical properties and methods of evaluation. Methods and apparatus of solid particles evaluation, metrology of apparatus, physical measurements of air flow, methods and equipment of air cleaning from pollutants, methods and equipment for air cleaning from chemical pollutants, determination of air cleaning equipment efficiency, exploitation of air cleaning equipment, security techniques and experiment, normative documents, EU directives, air pollution on human health.			

APGDB16054		ENGINEERING GEODESY		3 ECTS	
Lectures – 15 hours/semester		Practical works – N/A		Consultations – 2 hours/semester	
Laboratory works – 30 hours/semester			Individual work – 33 hours/semester		
Course aim		Gaining knowledge of mathematical models of the Earth, coordinates and elevation systems. Learning to read maps, topographical plans. To be able to select the appropriate measurement method and apparatus engineering geodetic surveying tasks.			
Course description		Geodesy: the scientific origin, evolution, branches. Land mathematical models, coordinates, elevation systems, guidance angles. Geodetic networks heights basis. Maps, plans. Horizontal, vertical, general plans, the use of devices. Tracks, area leveling. Profile. The static points planimetric and height layout, other marking works. Building elements of control measurements. Geodetic instrument conditions verification devices Preparing measurements.			

APGDB16052	ENGINEERING GEODESY		3 ECTS
Lectures – 15 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 30 hours/semester		Individual work – 33 hours/semester	
Course aim	Gaining knowledge of mathematical models of the Earth, coordinates and elevation systems. Learning to read maps, topographical plans. To be able to select the appropriate measurement method and apparatus engineering geodetic surveying tasks.		
Course description	Geodesy: the scientific origin, evolution, branches. Land mathematical models, coordinates, elevation systems, guidance angles. Geodetic networks heights basis. Maps, plans. Horizontal, vertical, general plans, the use of devices. Tracks, area leveling. Profile. The static points planimetric and height layout, other marking works. Building elements of control measurements. Geodetic instrument conditions verification devices Preparing measurements.		

APPEB16404	HEAT AND MASS TRANSFER		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	
Course aim	To form the basis for further study the building energy program specialist knowledge assimilation, to develop capacity and skills to creatively use the basic heat and mass transfer patterns on specific heat and gas supply, heating, ventilation, air conditioning, heat production targets.		
Course description	Fundamental concepts of heat transfer. Steady state of heat transfer by conduction and heat transmission. Free and forced convection. Convection with change of phase of fluid. Heat transfer by thermal radiation. Unsteady heat transfer. Heat exchangers and their calculations. Mass transfer.		

APAVB19402	HYDROLOGY		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 100 hours/semester	
Course aim	The aim of the course is to acquaint students with hydrology, hydrometry, hydrochemistry, hydroengineering analyzing the principles of formation of surface and underground water, analyzing aspects of quality change of surface and underground water and to understand the peculiarities of application of quality improvement measures, to understand the importance of hydrological parameters in hydroengineering.		

Course description	The module is designed to introduce with hydrology as a science covering all the waters of the earth, getting acquainted with the features of formation of surface and underground waters. To review the quality of Lithuanian waters, the causality of its change and to analyze the measures to improve it. To get acquainted with methods of calculation of hydrological characteristics. To review the characteristics of hydrotechnical structures, their classifications by the purpose.
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APPEB16407		INDOOR CLIMATE (WITH COURSE PROJECT)		6 ECTS
Lectures – 30 hours/semester		Practical works – 30 hours/semester		Consultations – 4 hours/semester
Laboratory works – N/A			Individual work – 96 hours/semester	
Course aim	To acquire and assimilate knowledge about building indoor climate - why it is important, what depends on it, what influence it, which parameters describe it, how it should be created and supported and how much of energy does it require. To understand the relations between indoor climate parameters, influencing factors and energy requirement in context of sustainable development and rational energy use. To learn and to get practical skills of evaluating of building characteristics, calculating.			
Course description	During this course the building indoor climate is comprehensively analysed - why it is important, what depends on it, what influence it, which parameters describe it, how it should be created and supported and how much energy does it require. The creation and supporting of necessary indoor climate is analysed using sustainable development principles - how to reach today's objectives without harming the welfare of future generations. During the practical exercises students learn to evaluate the building characteristics, calculate the necessary power of building indoor climate systems and annual energy amount needed for supporting the desired indoor climate.			

APAVB19603		INTEGRATED DESIGN OF BUILDINGS		3 ECTS
Lectures – 15 hours/semester		Practical works – 30 hours/semester		Consultations – N/A
Laboratory works – N/A			Individual work – 35 hours/semester	
Course aim	To give the basic knowledge about building graphic-information modeling. Learn to use software based on BIM technology.			
Course description	Principles and Levels of Integration of Building Information Modeling (BIM) Software. Concept of graphical-information model. Stages of Graphic-Information Model Creation. Principles of generating project documentation using a three-dimensional graphical-information building model. Co-ordination and synchronization of the actions of the participants of the design process, Infostatyba process management. Overview of Modern Computer Techniques, BIM Programs.			

APAVB19401	METHODOLOGY OF ENVIRONMENTAL RESEARCH		6 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – N/A	
Laboratory works – 30 hours/semester		Individual work – 100 hours/semester	
Course aim	Knowledge of environmental research methods is acquired in the study subject. Processes in the environment (air, water and soil), their impact on environmental pollution, peculiarities of pollutant migration in air, water and soil are analyzed. The subject teaches the selection of a specific sampling methodology for air, water and soil sampling. Also assess the required number of samples, select sampling sites. To ensure the quality of tests at all stages, both in the sampling and analysis laboratory and in the analysis of results. Get acquainted with various methods of parameter determination and apply them in the laboratory.		
Course description	To provide fundamental knowledge about the processes occurring in the environment, their impact on environmental pollution, patterns of migration of pollutants in soil, air and water. Understand the causes and effects of pollution, be able to apply the acquired knowledge in practice, select the best research methods and perform an analysis in the natural environment and the laboratory. Various pollution data are analyzed, the methods of displaying the results and the evaluation results are learned.		

APAVB19404	WASTE MANAGEMENT AND REUSE TECHNOLOGIES (WITH COURSE PROJECT)		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 96 hours/semester	
Course aim	To know about the sources of waste generation, waste reduction, and factors which may affect them, and the main characteristics of the waste handling methods and technologies. Understand the principles of sustainable environmental waste management. Know the principles of recycling, sorting machines, and technology. To become proficient in self-organize their work in solving practical problems of waste management system.		
Course description	Study subject knowledge acquired on the generation, sources of waste type and composition of the physical, chemical and biological properties of the waste management principles, legal framework and priorities for the management of waste collection, mechanical, biological and thermal treatment, waste disposal in landfills, hazardous waste and their sources of generation, re-use of waste and waste management in the context of sustainable development.		

APAVB19601	WASTEWATER TREATMENT AND SLUDGE PROCESSING (WITH COURSE PROJECT)		9 ECTS
Lectures – 45 hours/semester	Practical works – 30 hours/semester	Consultations – N/A	
Laboratory works – 15 hours/semester		Individual work – 150 hours/semester	
Course aim	To acquire knowledge of the composition and characteristics of wastewater, a required wastewater treatment level, municipal wastewater treatment and sludge processing technologies applied nowadays, to learn to design wastewater treatment and sludge processing facilities and to reasonably choose most suitable wastewater treatment and sludge processing technology.		
Course description	The knowledge is given of the composition and characteristics of wastewater; a required wastewater treatment level; preliminary, primary, biological wastewater treatment facilities; biological and chemical nitrogen and phosphorus removal from wastewater; the types, composition and characteristics of sludge generated at wastewater treatment plants, sludge processing units, sludge utilization potential.		

APAVM20107	ANTHROPOGENIC IMPACT ON ENVIRONMENT		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – N/A	
Laboratory works – 15 hours/semester		Individual work – 115 hours/semester	
Course aim	SDM is intended for deepening student knowledge about anthropogenic impact on environment and assessment of technosphere pollution level. This is achieved by gaining understanding about related risk and threats, developing abilities to work independently and in a team, using critical thinking for identification of problems and applying rational thinking in search of their solution.		
Course description	Study discipline module (SDM) will help students to deepen knowledge about anthropogenic impact on environment, associated risk and the level of extent of threat. Students will gain special abilities to minimize anthropogenic impact. Students will gain general abilities to deepen and structure the knowledge; to fulfill assigned task(s) and prepare for assessments independently during the semester; to think and assess situations critically; to work in a team; to prepare work tasks carefully and clearly; to submit work results systematically and clearly using visual aids.		

APAVM17144	ENVIRONMENTAL AUDIT		3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 50 hours/semester	

Course aim	Learn environmental protection audit objectives. To understand why and when it is needed for environmental protection audit. Know what kind of evaluation methodologies and valuation models can be used to analyze systems and models of development schemes to carry out the evaluation of results. Having acquired knowledge and practical skills to be able to independently perform tasks.
Course description	Study includes knowledge about environmental auditing, legislative history, its evolution. Sets out the environmental audit objectives and scope. Discusses environmental audit steps and methods used, the analysis of different economic sectors in the components and their relationships and their potential impact on the environment. Practical exercises, familiarization with the environmental audit stages in the form of questionnaires and interpretation discrepancies. Environmental audit assessment indicators and interpretation of results. The relevant EN ISO 14001 standard and application.

APAVM17140	ENVIRONMENTAL MANAGEMENT (WITH COURSE PROJECT)		9 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 180 hours/semester	
Course aim	The aim of this study subject is to present the main issues related to the development of the international environmental management organization and to emphasize the role of documents on environmental management in Lithuania and worldwide.		
Course description	Study subject knowledge acquired on the main issues related to international environmental management organization, the development of it, the role of documents of environmental management in the world and in Lithuania. This study subject is relevant as the environment management in any company becomes increasingly important in this world. An environmental management system addresses environmental concerns throughout an installation operations in organizations, including environmental auditing, international environmental management organization series of documents for environmental labelling, environmental performance evaluation, life-cycle assessment, environmental policy and other further tools of the environmental management.		

APGDM17040	GEODETIC LASER SCANNING TECHNOLOGIES (WITH COURSE PROJECT)		6 ECTS
Lectures – 15 hours/semester	Practical works – N/A	Consultations – N/A	
Laboratory works – 30 hours/semester		Individual work – 115 hours/semester	
Course aim	Knowledge about laser scanning technologies, their constructions and abilities of use it in geodetic measurements. Ability to perform measurements, process data and compute its accuracy.		

Course description	Laser scanning technologies and its use in geodetic measurements. Operating principles of laser scanning technologies. Measurement techniques using laser scanners. Laser scanning data processing and reporting.
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APGDM17044	GEOINFORMATION SYSTEMS TECHNOLOGY		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A		Consultations – N/A
Laboratory works – 15 hours/semester		Individual work – 115 hours/semester	
Course aim	Prepare specialists of measurement engineering who obtained latest knowledge related to the technologies of the geoinformation systems, being able to understand, analyse and rise the problematic questions on the technologies of the geoinformation systems, with involving to their solutions the methods of the information technologies, creation and development of the geodetic control.		
Course description	Variety of Technologies of Geoinformation Systems. The core of real phenomena model and data models of Geoinformation Systems. Geometrical and attribute data. Topology of data of Geoinformation Systems. Archiving, upgrading, quality and safety of the data. Standards of Geoinformation Systems. Thematic data of Geoinformation Systems. The usage of Geoinformation Systems for thematic mapping.		

APGDM17043	REAL ESTATE CADASTRE		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A		Consultations – N/A
Laboratory works – 15 hours/semester		Individual work – 115 hours/semester	
Course aim	The module is aiming to gain a theoretical and practical knowledge about the real estate (land and buildings) formation, cadastre and his requirements for data collection and analysis in order to register real estate cadastral data into the real estate register. Also, the existing practices of real estate cadastre and registration to be analyzed.		
Course description	The content of the module: Policies regulating real estate formation, cadastre and registration; real estate formation methods; measurements for real estate cadastre; data collection and analysis for real estate registration. Also, the existing international practices of real estate cadastre and registration to be analyzed.		

APGDM17041	REMOTE SENSING METHODS		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – N/A	
Laboratory works – 15 hours/semester		Individual work – 115 hours/semester	
Course aim	Gain ability to analyze, to process the satellite imagery and to apply the remote sensing methods for territory mapping, having information about methods for getting remote sensing geodata and used sensors/platforms.		
Course description	Acquisition of the space data. Physical aspects on remote sensing of Earth surface. Remote sensing means: sensors and platforms. Multispectral scanners. Methods of remote sensing data processing. Geometric and radiometric correction of photographic images. Interpretation and application of remote sensing data.		

APAVM17141	WASTE MANAGEMENT (WITH COURSE WORK)		9 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 180 hours/semester	
Course aim	SDM is intended for deepening student knowledge about underlying waste management methods and their performance assessment in the context of sustainable development. This is achieved by gaining understanding about related risk and threats, developing abilities to work independently and in a team, using critical thinking for identification of problems and applying rational thinking in search of their solution.		
Course description	Study discipline module (SDM) will help students to deepen knowledge about underlying waste management methods and their performance assessment in the context of sustainable development. Students will gain special abilities to find solution for the waste management problem using modern informative technologies. Students will gain general abilities to deepen and structure the knowledge; to fulfill assigned task(s) and prepare for assessments independently during the semester; to think and assess situations critically; to work in a team; to prepare work tasks carefully and clearly; to submit work results systematically and clearly using visual aids.		

FUNDAMENTAL SCIENCES FACULTY

FMCHB16203	ANALYTICAL CHEMISTRY		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work – 96 hours/semester	
Course aim	Impart fundamental knowledge and develop abilities necessary for a job in biotechnology sphere.		
Course description	Analytical chemistry history. Qualitative and quantitative analytical chemistry. Distribution of cations by acide-base metode. Qualitative reactions of anions. Classical (gravimetric, volumetric) and instrumental analytical methods. Samples preparation for analysis. Choise of analytical metode. Accuracy.of results.		

FMFIB16214	APPLIED PHYSICS		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	
Course aim	To provide knowledge of the electrostatic, direct and alternating electrical current, magnetic field, electromagnetic oscillations and waves, wave and quantum optics, solid-state structure of the framework, atomic and nuclear physics. Contribute to the physical framework for studying specific subjects.		
Course description	Taught electrostatic field, electric current, magnetic field, electromagnetic oscillations and waves, wave and quantum optics, solid state band theory, atomic and nuclear physics. Emphasis is placed on all sections of the spectrum of electromagnetic waves on human body, the thermal radiation patterns, thermal pollution, the application of laser science and technology, nuclear physics and radiation issues.		

FMFIB19223	APPLIED PHYSICS		3 ECTS
Lectures – 6 hours/semester	Practical works – 6 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 66 hours/semester	
Course aim	To give students the theoretical knowledge of modern physics and practical skills required in analysis and application of fundamental laws of nature. To describe the academic achievements of emerging technologies in the content, to teach how to evaluate the theoretical and experimental data and their reliability.		

Course description	Applied Physics module gives knowledge on electrostatic field effects, explains appearance and dynamics of electric conductivity of materials and electric current that generates a magnetic field. Electromagnetic induction in vehicles. It explains physical properties of Electromagnetic waves that propagate through various media, laws of optics and its engineering applications, solid body concept, modern concept of atomic nuclear and connection with transport engineering.
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FMFIB16220	APPLIED PHYSICS		3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 33 hours/semester	
Course aim	To give knowledge about materials in electrical and magnetic fields, electromagnetic waves, the spectrum of their appliance and the use in technique and technologies. To explain the nature of electromagnetic wave, to give modern view about the atom and nuclear physics, to characterize the content of created technologies achieved by physics science, to teach to estimate theoretical and experimental got data and their reliability, to prepare for the bioengineering studies.		
Course description	Materials in electric and magnetic fields. Electromagnetic oscillations and waves, their characteristics and laws. Photometry. Waves and quantum phenomena determined by electromagnetic radiation. Electrographic and neutronographic methods of the researches of materials and their application. Nuclear energy.		

FMFIB16216	APPLIED PHYSICS		3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 48 hours/semester	
Course aim	To give knowledge on subject of the behavior of charge in electric and magnetic fields, electromagnetic waves, their energy spectrum and application. To explain the quantum nature of electromagnetic waves, to describe the academic achievements of emerging technologies in the content, to develop scientific thinking skills, To give knowledge on subject of the behavior of materials in electric and magnetic fields, electromagnetic waves, their energy spectrum and application.		
Course description	This module gives knowledge on electrostatic field effects, explains appearance and dynamics of electric conductivity, voltage, potential and electromotive force. Explained how electric current generates a magnetic field. It explains physical properties of electromagnetic waves, main laws of optics and its applications, the structure of atoms, crystalline structure of solids. It discusses a nature of atom's nucleus and gives most modern ideas regarding composition of nucleons and describes a state of electrons in a crystal by means of theory of energy bands and principles of semiconductor devices operation.		

FMISB19600	ARTIFICIAL INTELLIGENCE AND KNOWLEDGE SYSTEMS		3 ECTS
Lectures – 24 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 12 hours/semester		Individual work – 42 hours/semester	
Course aim	Learning of an advanced topics in the artificial intelligence and its information systems related applications.		
Course description	The role of AI in IS, knowledge representation and reasoning, application of knowledge-based systems in IS, problem solving and agents, planning, simple planning agents, application of software agents in IS, distributed AI and agents societies, swarm intelligence and its application in IS, learning, application of learning in IS, other modern AI methods and their application in IS.		

FMITB20601	BASICS OF DISTRIBUTED SYSTEMS		6 ECTS
Lectures – 24 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 24 hours/semester		Individual work – 108 hours/semester	
Course aim	To teach students properly understanding of project management concept, as a view to modern method of management, to give theoretical and practical knowledge about types of projects, their purposes, cycle of project implementation, structure of business (activities) plan, to provide knowledge on the principles of project team formation, peculiarities of supervisor selection, business project control and changes performance management, project risk evaluation and management methodology.		
Course description	Students will be introduced to principles of distributed systems, will analyze how can be distributed data within different systems or services, how it is processed and used. Subject is oriented to programming, application solutions rather than technical details. Therefore topics of MySQL, Oracle databases are included to address existing solutions for data distribution, distributed file systems, P2P, RMI and other similar technologies are analyzed.		

FMCHB19606	BIOCHEMICAL ENGINEERING AND BIOTECHNOLOGY		3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 31 hours/semester	
Course aim	Numerical methods applied to biotechnology engineering problems. Use of computational tools such as MATHCAD and EXCEL to solve biotechnology engineering problems. Statistical methods.		

Course description	Bioreactor design and analysis, batch reactor, plug flow and packed bed bioreactors. Imperfect mixing. Biological waste water treatment. Separation of insoluble particles. Filtration. Chromatography.
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FMCHB19601	BIOCHEMICAL METHODS		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work – 81 hours/semester	
Course aim	Introduction to the biochemical analysis methods in biochemistry, medicine, food quality control and environmental protection.		
Course description	The course mainly focuses on biochemical recognition process and its implementation in different analytical methods. Spectral and electrochemical methods and their application in analysis of biomolecules, as well as enzymatic analysis methods, methods of biomolecules immobilization and methods of immunoanalysis are analyzed in detail. A lot of attention is paid for application of statistical methods in laboratory.		

FMCHB16204	BIOLOGY		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 96 hours/semester	
Course aim	To introduce to the principles of biology: the cell structure, cell structure elements and function organization, genomes organization, chromosomal basis of inheritance, DNA as genetic material, origin of life and evolution, molecular tools.		
Course description	Exploring life on its different levels. The chemistry of life and the structure of prokaryotic and eukaryotic cell. The eukaryotic cell cycle, mitosis and meiosis. The role of meiosis in an organism life cycle. G. Mendel's discoveries. Mendelian inheritance in humans. Basics of human genetics. DNA as the genetic material, DNA replication. The chemical structure and function of carbohydrates, lipids and proteins. Concept of transcription and translation. The organization of eukaryotic genomes. DNA cloning and practical application. An introduction to the viruses, viroids and bacteriophage, their genomes and reproduction. The evolution of populations, the factors affecting the evolution.		

FMCHB19401	CHEMICAL KINETICS		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work – 81 hours/semester	
Course aim	Introduction to chemical kinetics and its applications.		
Course description	Main concepts of chemical kinetics. Formal kinetics: rate equations of elementary and complex chemical reactions. Rate dependence of temperature, energy of activation. Dynamics of chemical reactions: effective collisions and transition state theories. Marcus electron transfer theory. Electrode processes. Bioelectrocatalytic systems. Kinetics of DNA/RNA and protein synthesis.		

FMCHB16202	CHEMISTRY		3 ECTS
Lectures – 15 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 48 hours/semester	
Course aim	To provide the students with chemistry knowledge necessary in the studies of the general and special courses as well as in the practice activities.		
Course description	Introduction to the course studies. Dissolution of materials and formation of solutions. Expression of solution concentration and methods for its calculation. Electrolytical dissociation in the electrolyte solutions. Oxidation-reduction processes in electrolyte solutions. Electrochemical processes within galvanic cells, electrolysis and corrosion of metals, the methods of protection the metals against corrosion.		

FMCHB19402	CHEMISTRY OF NATURAL COMPOUNDS		9 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 6 hours/semester	
Laboratory works – 30 hours/semester		Individual work – 144 hours/semester	
Course aim	Aware of the biologically important organic substances (proteins, carbohydrates, lipids, DNA and RNA, bioregulators).		
Course description	Chemistry and bioorganic chemistry of amino acids. Carbohydrates. Components of nucleic acids and general structure of RNA and DNA. Lipids. Naturally occurring biologically active compounds. Enantioselective transformations, toxicity of reactions. Enzyme catalysed organic reactions. Enzyme models. Structure determination methods of bioorganic molecules.		

FMITB20400	DATABASE SYSTEMS		6 ECTS
Lectures – 24 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 24 hours/semester		Individual work – 108 hours/semester	
Course aim	To get acquainted with the main principles of database work using SQL.		
Course description	The course is designed to acquaint students with the concepts of relational databases and relational database management systems, the principles of their work. Provides information on possible actions with database data using commands and operators. Normalization of databases to the third normal form is introduced.		

FMMMB16207	DISCRETE MATHEMATICS		3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 48 hours/semester	
Course aim	Acquaint with the main concepts, problems and solution methods of discrete mathematics. Students should know how to solve classical discrete mathematics problem after this course.		
Course description	Combinations of elements in finite sets. Combinatorial numbers. Generating functions. Recursive equations. Relations theory. Ordered sets. Relations between rates of increase and decrease of number sequences elements. Graphs theory. Oriented graphs and relations. Loops in graphs. Algorithms of graphs analysis. Complicated tasks. Elements of the information theory.		

FMMMB22301	DISCRETE MATHEMATICS		3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 48 hours/semester	
Course aim	To acquaint with the main concepts and tasks of mathematical logic, set theory, relation theory, graph theory and methods for solving them. To develop the ability to solve classical problems in discrete mathematics.		
Course description	Basics of mathematical logic. Logical operations, truth tables, logic formulas and laws. Boolean functions. Conjunctive and disjunctive normal forms. Functionally complete sets of Boolean functions. Sets and relations. Properties of binary relations. Composition and transitivity of relations. Equivalence and order relations. Graph theory. Undirected simple graphs. Graph measures and metrics. Stable sets. Euler and Hamiltonian cycles.		

FMMMB16202		DISCRETE MATHEMATICS 2		6 ECTS
Lectures – 45 hours/semester		Practical works – 30 hours/semester		Consultations – 4 hours/semester
Laboratory works – N/A			Individual work – 81 hours/semester	
Course aim	To acquaint with basic concepts of graph and number theory, complexity of algorithms, informatikon theory. Students must be able solve typical problems, apply modern mathematical methods to solve real life problems.			
Course description	Graph theory. Elements of number theory. Complexity of algorithms. Elements of informatikon theory.			

FMSAB19369		ECONOMETRICS		6 ECTS
Lectures – 45 hours/semester		Practical works – 15 hours/semester		Consultations – 4 hours/semester
Laboratory works – N/A			Individual work – 96 hours/semester	
Course aim	The aim of this course is to introduce the main econometrics models and to consider their application in practice.			
Course description	The main conceptions in creating linear regression and time series statistical models are presented in this course. The questions of a model identification, fitting the models parameters, model diagnostic and forecasting are considered. Besides theoretical knowledge students have to solve tasks on the black board and using the special statistical program package for full statistical analysis.			

FMSAB19370		ECONOMETRICS (COURSE WORK)		3 ECTS
Lectures – N/A		Practical works – N/A		Consultations – N/A
Laboratory works – 30 hours/semester			Individual work – 50 hours/semester	
Course aim	The aim of this course is to introduce the main econometrics models and to consider their application in practice.			
Course description	The main conceptions in creating linear regression and time series statistical models are presented in this course. The questions of a model identification, fitting the models parameters, model diagnostic and forecasting are considered. Besides theoretical knowledge students have to solve tasks on the black board and using the special statistical program package for full statistical analysis.			

FMFIB19214		ENVIRONMENTAL PHYSICS		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – 4 hours/semester
Laboratory works – 15 hours/semester			Individual work – 96 hours/semester	
Course aim	To give the theoretical knowledge in environmental physics and form the practical skills in application of fundamental laws of nature. To contribute to the physical framework for studying specific subjects.			
Course description	The subject provides students with the knowledge of electrostatic phenomena in the atmosphere, laws of light propagation in the atmosphere, heat pollution, ionizing and non-ionizing electromagnetic radiation in the environment, sound characteristics and acoustic pollution, kinetic and thermal properties of liquids, hydrodynamic processes in oceans, seas and rivers, earth's physical characteristics, earth's magnetic field, dynamics of earth's crust, sources of renewable and non-renewable energy and energy conversion physics in them. The most important physical processes occurring in the atmosphere, hydrosphere and lithosphere are emphasized by taking into consideration the special subjects taught in the Faculty of Environmental Engineering.			

FMCHB19605		FUNDAMENTALS OF BIOINFORMATICS. COMPLEX PROJECT		6 ECTS
Lectures – 15 hours/semester		Practical works – N/A		Consultations – 4 hours/semester
Laboratory works – 30 hours/semester			Individual work – 111 hours/semester	
Course aim	To train abilities to use bioinformatics tools and methods for analysis of DNA/RNA/proteins sequences and structural modelling of protein structure and protein/substrate complexes.			
Course description	Introduction to bioinformatics, DNA/RNA structure, functions, analysis and search of DNA/RNA sequences. Modelling of protein structure with bioinformatical methods. Relation between structure of protein and its function. Modelling of protein-substrate complexes.			

FMCHB19603		FUNDAMENTALS OF CHROMATOGRAPHY (WITH COURSE WORK)		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – 4 hours/semester
Laboratory works – 30 hours/semester			Individual work – 81 hours/semester	
Course aim	To introduce students with the basic terms of chromatography, the methods of liquid chromatography and principles of their application.			
Course description	Classification and basic principles of chromatography. Fundamentals of modern column liquid chromatography. Principles of column liquid chromatography modes according to the mechanism of separation.			

FMCHB19602		FUNDAMENTALS OF GENE ENGINEERING		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – 4 hours/semester
Laboratory works – 30 hours/semester			Individual work – 81 hours/semester	
Course aim	The main purpose of the course is to assimilate the concept of gene engineering and understand the practical possibilities of implementation of gene engineering.			
Course description	The fundamentals of gene engineering investigate structure of prokaryotic and eukaryotic genes, regulation of gene expression; characteristics and structure of vectors; enzymes involved in gene engineering process; construction of recombinant DNA and introduction into tested organism as well as methods of gene detection; theoretical and practical basis of isolation, purification, qualitative and quantitative analysis of recDNA.			

FMCHB19404		FUNDAMENTALS OF MICROBIOLOGY		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – 4 hours/semester
Laboratory works – 30 hours/semester			Individual work – 81 hours/semester	
Course aim	To indoctrinate with fundamentals of of microbiology: scope of microbiology, characteristics of prokaryotic and eukaryotic microorganisms, growth, culturing and metabolism of bacteria, microbial genetics, main research methods, classification of microorganisms; ecology and application of microbes in industry.			
Course description	The diversity of microorganisms and their distribution in nature. Eukaryotic and prokaryotic cells, comparison of structure. Archaeobacteria and Eubacteria. Systematics of microorganisms. Propagation and growth conditions of microorganisms, methods for their cultivation, physiology of microorganisms. Metabolism of microorganisms, biosynthesis. Ecology, symbiosis and evolution of microorganisms. Application of microorganisms in industrial microbiology.			

FMIGB17001		GENERAL AND APPLIED ENGINEERING GRAPHICS		6 ECTS
Lectures – 15 hours/semester		Practical works – 30 hours/semester		Consultations – 4 hours/semester
Laboratory works – 15 hours/semester			Individual work – 96 hours/semester	
Course aim	To present graphical problems solving algorithms, to develop abilities to read and make engineering drawings, adapting theoretical knowledge and according to drawing standards requirements and also to manage computer - aided design tools, to develop spatial imagination.			

Course description	Drawing devices, tools and accessories. Formation of drawings: standards, scales, lines, fonts. Projection methods, projections of points, lines and planes. Projection of parts into three projection planes; viewing of international holes, cavity; views and their displacement in drawings; sections, incomplete sectional views, enlarged part view elements, conditionalities and simplifications. Solid modeling according to pictorial projections and to the views given. Surface modeling. Surfaces intersection and their developments.
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FMIGB16203	GENERAL ENGINEERING AND DIGITAL GRAPHICS		6 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work – 96 hours/semester	
Course aim	To present the general engineering and computer graphics fundamentals necessary in civil engineering design. To acquaintance with basic methods of general descriptive geometry, principles of orthographic projections, design methods, to introduce with modern computer aided design systems. Projection drawing. Views, arrangement of views in drawings. Simple and complex sections.		
Course description	The basic practice of engineering graphic in computer aided design systems. Software review, possibilities. Preparation of constructions, mechanicals and other drawing types. Peculiarities of drawing arrangement. Drawings standards. Modeling of 2D drawings, objects projections in one plane. General methods of the composition of volumetric models. Basis of 3D modeling. Representation of 3D objects, arrangement of projections. Surfaces, peculiarities of modeling of surfaces. Projection drawing. Views, arrangement of views in drawings. Simple and complex sections.		

FMIGB16003	GENERAL ENGINEERING GRAPHICS		6 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work – 96 hours/semester	
Course aim	To present the general engineering and computer graphics fundamentals necessary in civil engineering design. To acquaintance with basic methods of general descriptive geometry, principles of orthographic projections, design methods, to introduce with modern computer aided design systems. Projection drawing. Views, arrangement of views in drawings. Simple and complex sections.		

Course description	The basic practice of engineering graphic in computer aided design systems. Software review, possibilities. Preparation of constructions, mechanicals and other drawing types. Pecularityties of drawing arrangement. Drawings standards. Modeling of 2D drawings, objects projections in one plane. General methods of the composition of volumetric models. Basis of 3D modeling. Represenatation of 3D objects, arrangement of prejections. Surfaces, peculiarities of modeling of surfaces. Projection drawing. Views, arrangement of views in drawings. Simple and complex sections.
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FMIGB16202	GENERAL ENGINEERING GRAPHICS		3 ECTS
Lectures – 6 hours/semester	Practical works – 6 hours/semester	Consultations – 2 hours/semester	
Laboratory works – 6 hours/semester		Individual work – 60 hours/semester	
Course aim	To present graphical problems solving algorithms, to develop abilities to read and make engineering drawings, adapting theoretical knowledge and according to drawing standards requirements and also to manage computer - aided design tools, to develop spatial imagination.		
Course description	Module contains the information about general principles of drawing making, standards applying, theoretical basic of engineering graphics and about computer modeling potentialities.		

FMGSB18210	GRAPHIC PROGRAMMING FOR MOBILE DEVICES		6 ECTS
Lectures – 15 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 111 hours/semester	
Course aim	1) Work with user interface prototyping software for mobile devices; 2) Create interface prototypes for mobile devices; 3) Choose interface styles for different mobile device platforms; 4) Work independently.		
Course description	Current progress of technology enables almost everybody to have a mobile phone. Very often, the phone is used not only for its primary function, but for various other tasks, essentially it becomes multifunctional mobile device. Graphical possibilities of these devices are discussed in the module.		

FMGSB22201	HUMAN COMPUTER INTERACTION		6 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work – 96 hours/semester	

Course aim	After this course students should be able to: apply basic knowledge of HCI principles and techniques; develop software, which has human-computer interface created regarding to HCI principles; ensure proper communication between elements in user interface; effectively work in team, which develop information systems.
Course description	Students are acquainted with human-computer interaction (HCI) theory, psychological factors of HCI, general HCI design principles, guidelines and templates. Orientation to customer needs. User interfaces types and their creation methods. Training to perform software testing based on HCI principles. Software development with focus on the proper application of user interface elements. During laboratory work, students receive independent assignments that include theoretical (analysis) and practical parts. During the semester, students have to create interactive layouts or prototypes of software, focusing on the ease of user interface and ease of use.

FMMMB16201	INTEGRAL CALCULUS		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 96 hours/semester	
Course aim	The aim of this course is to provide the knowledge from integral calculus, to achieve the ability to analyze situation, to choose the appropriate problem solving method, to present and clarify the obtained results, to develop the ability use the knowledge and practical abilities in the study process.		
Course description	Integral calculus of functions of one variable: anti-derivatives, indefinite and definite integrals, the basic definitions, methods of integration, the properties of indefinite and definite integrals, Newton-Leibnitz formula, applications of definite integrals, multivariable functions, double and line integrals, ordinary differential equations and their solutions.		

FMSAB16202	INTEGRAL CALCULUS		6 ECTS
Lectures – 10 hours/semester	Practical works – 6 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 6 hours/semester		Individual work – 134 hours/semester	
Course aim	The aim of the course is to introduce notions of indefinite, definite, improper, multiple integrals, to discuss applications of the integral, to present elements of differential equations and infinite series.		
Course description	In the course various methods of integration and application of the integral calculus in geometry, mechanics, etc., are discussed. Multiple and line integral are evaluated using polar, cylindrical, spherical coordinates, their application are discussed. Differential equations of the first and higher orders as well as system of differential equations are solved. Infinite series are applied for various approximations.		

FMSAB19209		INTEGRAL CALCULUS		6 ECTS
Lectures – 30 hours/semester		Practical works – 30 hours/semester		Consultations – 4 hours/semester
Laboratory works – N/A			Individual work – 96 hours/semester	
Course aim	The aim of the course is to introduce notions of indefinite, definite, improper, multiple integrals, to discuss applications of the integral, to present elements of differential equations and infinite series.			
Course description	In the course, the definition of indefinite integral, various integration techniques, definite integrals and their applications in geometry, mechanics and engineering are considered. Double and triple integrals, differential equations of the first and second orders and various applications are presented. Also, the course is designated for number and function series and their application in approximate calculation.			

FMMMB16210		INTEGRALS, DIFFERENTIAL EQUATIONS AND SERIES		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – 4 hours/semester
Laboratory works – 15 hours/semester			Individual work – 96 hours/semester	
Course aim	The aim of this course is to provide the knowledge from integral calculus, the theory of differential equations and series elements, to achieve the ability to analyze situation, to choose the appropriate problem solving method, to present and clarify the obtained results, to develop the ability use the knowledge and practical abilities in the study process.			
Course description	Integral calculus of functions of one variable: anti-derivatives, indefinite and definite integrals, the basic definitions, methods of integration, the properties of indefinite and definite integrals, Newton-Leibnitz formula, applications of definite integrals, multivariable functions, double and line integrals, ordinary differential equations and their solutions.			

FMMMB16211		MATHEMATICS 2		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – 4 hours/semester
Laboratory works – 15 hours/semester			Individual work – 96 hours/semester	

Course aim	The aim of this course is to provide the knowledge from integral calculus, the theory of differential equations and series elements, to achieve the ability to analyze situation, to choose the appropriate problem solving method, to present and clarify the obtained results, to develop the ability use the knowledge and practical abilities in the study process.
Course description	Integral calculus of functions of one variable: anti-derivatives, indefinite and definite integrals, the basic definitions, methods of integration, the properties of indefinite and definite integrals, Newton-Leibnitz formula, applications of definite integrals, multivariable functions, double and line integrals, ordinary differential equations and their solutions.

FMGSB19201	MEDIA PRODUCTION		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 98 hours/semester	
Course aim	This course will provide students with such knowledge: 1) Terminology and definitions used in audiovisual industry; 2) Screenwriting for short films: structure & dramaturgy; Industry standart script formatting; 3) Audio and video equipment - theoretical knowledge ant practical skills; 4) Video editing - basics of using Adobe Premiere software; 5) Film crew: Roles and responsibilities; 6) Various media forms (advertising, music video clips, etc.) and their application.		
Course description	"Media production" provides students with a general knowledge on audiovisual arts industry. Module introduces all stages of film production - development, production, editing and postproduction. Students gain theoretical and practical knowledge on using audio and video equipment, develop practical video editing, scriptwriting skills.		

FMITB21201	OBJECT-ORIENTED PROGRAMMING (WITH COURSE WORK)		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 30 hours/semester		Individual work – 96 hours/semester	
Course aim	To provide every major C++ language feature and the standard library facilities, to get understanding of the ideas presented in related lectures behind the language facilities, leading to mastery.		
Course description	This module provides students with a comprehensive study of the C++ programming Language. The course stresses the object paradigm including classes, inheritance, virtual functions, and templates. Beside the base C++ studies, presented course extends C++ skills to include C++/CLI. ISO/ANSI C++ essentials are featured by .net examples.		

FMFIB16229	PHYSICS 2		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 33 hours/semester	
Course aim	To give students the theoretical knowledge and problem-solving skills required in analysis and application of fundamental laws of nature.		
Course description	Electrostatics. Electrical properties of substances, theory of their conductivity. Magnetic field in vacuum and material. Maxwell's equations for electromagnetic field. Wave optics. Light interaction with materials. Quantum mechanics. Laser. Biological effects of radioactive radiation.		

FMGSB19203	PHYSICS FOR GAMES		3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 48 hours/semester	
Course aim	To acquire and assimilate knowledge about behavior of game objects under action of forces at known boundary and initial conditions. To understand main fundamental principles of statics and dynamics.		
Course description	Object of mechanics. Idealizations. Fundamental axioms, laws and notions of mechanics. Particle, rigid body, mechanical system. Force, couple, moment, link. Free-body diagram. Equilibrium of particle and rigid body. Distributed loads, gravity centre. Friction. Notions of kinematics. Velocity, speed, acceleration, path. Kinetics of particle and body. Fundamental theorems of kinetics. Motion modelling of game objects.		

FMMMB16209	PROBABILITY THEORY AND MATHEMATICAL STATISTICS		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 96 hours/semester	
Course aim	To introduce the methods of calculation of indefinite and definite integrals and their applications. Present classification of differential equations and their solutions, to introduce the numerical and functional series.		

Course description	Antiderivative. Definite integrals and their application. Functions of several variables. Partial derivatives. Extreme values. First order differential equations. Higher order differential equations. Higher order linear differential equations with constant coefficients. Number series. Power series and their application.
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FMSAB19206	PROBABILITY THEORY AND MATHEMATICAL STATISTICS		9 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 6 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 159 hours/semester	
Course aim	To provide students with an understanding of the probability theory, to develop their ability to solve problems of mathematical statistics and apply their knowledge for statistical data analysis.		
Course description	The course is devoted to the basics of the probability theory and mathematical statistics. The definitions for random event and probability are formulated, their main properties are presented. Random variables and their properties are studied, acquaintance with some discrete and continuous random distributions is made further. The second part of the course consists of the main principles of mathematical statistics. Methods for population parameter estimation and statistical hypothesis testing are overviewed. Each topic is illustrated by applications and solutions of practical tasks. Computer software application in statistics is introduced for students.		

FMITB16429	PROGRAMMING TECHNIQUES (WITH COURSE PROJECT)		6 ECTS
Lectures – 24 hours/semester	Practical works – 12 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 24 hours/semester		Individual work – 96 hours/semester	
Course aim	To provide object oriented programming knowledge and skills to apply it in Java programming language.		
Course description	Object-oriented programming course based on the Java programming language. The course will cover principles of object oriented programming: classes, objects, encapsulation, inheritance, polymorphism, visibility of class elements. Memory management, exception management, standard Java libraries, networked features of Java technology are introduced. The course provides examples on good programming practice and Java language usage for development of mobile applications (Android) and web systems (JEE).		

FMITB21610	SOFTWARE TESTING		6 ECTS
Lectures – 24 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 24 hours/semester		Individual work – 108 hours/semester	

Course aim	Obtain basic software testing theoretical and practical knowledge.
Course description	Practical and theoretical knowledge about software testing is presented in this module. Testing methods and tools for functional and nonfunctional testing are described. The tools and methods are used practically during lab works. Web application testing, web services testing are considered. Automation of testing is presented. Automated tests' generation and execution frameworks and tools are presented and used by the students during course.

FMISM20201	COMPUTER NETWORKS AND OPERATING SYSTEM SECURITY		9 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 180 hours/semester	
Course aim	The module aims at providing students theoretical and practical knowledge on computer network and operating system secure exploitation and management.		
Course description	Appropriate computer network and operating system exploitation is a part of company's information security policy that requires specific knowledge and practice. Efficiency of information security measures is directly proportional to understanding of information systems interconnections and their application as a complex of measures. The module reviews the main problem areas in computer network and operating system security and provides possible solution scenarios.		

FMISM20202	ETHICAL HACKING TECHNIQUES (WITH COURSE WORK)		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – N/A	
Laboratory works – 15 hours/semester		Individual work – 115 hours/semester	
Course aim	To provide students with knowledge and skills necessary to evaluate information systems security from outside of the organization.		
Course description	Ethical hacking and vulnerability scanning technologies are evaluated as compulsory part of any organization's information system security evaluation. While studying this course students will get familiar with different vulnerability scanning technologies and learn how to act as an ethical hacker, detecting existing vulnerabilities in organization's IT infrastructure without harming its functioning. The possessed understanding of methods and techniques used by hackers will also help the security specialist to plan appropriate countermeasures and evaluate their effectiveness.		

FMISM18200		MALWARE ANALYSIS METHODS		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – N/A
Laboratory works – N/A			Individual work – 115 hours/semester	
Course aim	To get acquainted with malware functionality and how to detect it.			
Course description	Malware analysis is one of the most critical skills for people, planning security analyst career. During this course, students will get known with malware, methods how malware is analyzed, what tools are used. Students that choose this course will create their own malware analysis laboratories where brief or in-depth malware analysis can be performed on infected documents, executables, media files. This course covers parts of reverse engineering, disassembly, network traffic analysis and other methods. Course is recommended for students, interested in incidence responses, work with malware and understanding how it acts and what methods exist to analyze and stop it.			

FMISM17202		VIRTUAL INFRASTRUCTURE AND CLOUD COMPUTING SECURITY		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – N/A
Laboratory works – N/A			Individual work – 115 hours/semester	
Course aim	Provide knowledge on virtualization technologies, virtual infrastructure and clouds, to develop ability to evaluate threats and vulnerabilities in virtual infrastructure and clouds and to make decisions on security management in virtual infrastructure and clouds.			
Course description	The course provides knowledge of virtualization technologies, Linux containers, virtual infrastructure architecture, virtual repositories, clouds, and relevant security solutions used in these IT technologies. It teaches to evaluate security threats and vulnerabilities in virtual infrastructure and cloud computing and to make decisions that mitigate security risk in virtual infrastructure. Subject deals with security threats of hypervisor, virtual network, repositories, covers security aspects of virtual desktop infrastructure, virtual infrastructure maintenance and operational activities are analyzed. Security of cloud models and methods is reviewed, also data privacy, identity, contract management aspects in the clouds are analyzed, cloud security standards are reviewed.			

MECHANICS FACULTY

MEMKB22401		3D, LASER AND ANOTHER MANUFACTURING TECHNOLOGIES		3 ECTS	
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – 2 hours/semester	
Laboratory works – N/A			Individual work – 33 hours/semester		
Course aim	To acquire knowledge about traditional mechanical and non-traditional and innovative materials processing technologies. Form the ability to correctly select materials and production technologies, to get to know some of the processing operations in practice.				
Course description	Materials processing technologies: cutting (turning, milling, drilling, deepening, expansion, threading, scraping, abrasive processing, etc.), deformation processing (stamping, rolling, pressing, etc.), casting technologies; processing of concentrated energy - laser cutting, drilling, welding, hardening, electron beam processing, magnetic and electromagnetic fields technologies; processing of water and abrasive jet, magnetically abrasive treatment, ultrasonic technologies, electroerosol treatment; electroplating, electro-hydraulic impact and other technologies.				

MERSB17122		BACHELOR GRADUATION THESIS 2		6 ECTS	
Lectures – N/A		Practical works – N/A		Consultations – N/A	
Laboratory works – N/A			Individual work – N/A		
Course aim	To learn to write the Project theoretical part, to make technical calculations, to draw correctly drawings, present and define them.				
Course description	According to the work task are developed the schemes of construction of mechanisms and devices, are calculated construction, kinematical and other parameters are creating the control schemes and algorithms. On the basis of loading are calculated the main construction sizes of the parts. The common views, assembly drawings and diagrams are creating of devices and their parts.				

MEMKB17237		BACHELOR GRADUATION THESIS 3		9 ECTS	
Preparation for evaluation – 10 hours/semester			Final thesis - 230 hours/semester		
Course aim	To learn to write the Project theoretical part, to make technical calculations, to draw correctly drawings, present and define them.				

Course description	Calculation correction, selection of the schemes and the workflow. In design final works are made 4 of A1 size drawings - general view, assembly drawings of separate mechanisms and drawings of parts. In technological final works are made 4 of A1 size schemes of the technological processes and economical evaluation.
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MERSB17123	BACHELOR GRADUATION THESIS 3		9 ECTS
Lectures – N/A	Practical works – N/A	Consultations – N/A	
Laboratory works – N/A		Individual work – N/A	
Course aim	To learn to write the Project theoretical part, to make technical calculations, to draw correctly drawings, present and define them.		
Course description	Calculation correction, selection of the schemes and the workflow. In design final works are made 4 of A1 size drawings - general view, assembly drawings of separate mechanisms and drawings of parts. In technological final works are made 4 of A1 size schemes of the technological processes and economical evaluation.		

MERSB22401	CAD/CAE		3 ECTS
Lectures – 15 hours/semester	Practical works – 30 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 33 hours/semester	
Course aim	Implementation of modern 3D systems for geometric form generation, construction parameters analysis and preparation of computer aided manufacturing.		
Course description	Overview of computer aided design and manufacturing. Computer aided design (CAD) and computer aided manufacturing (CAM) components, hardware and software. Concept of CAD: three-dimensional (3D) modeling, virtual modeling, integrated quality control. Interface between CAM and CAD. Fundamentals of CAM. Computer aided engineering.		

MERSB17112	CAD/CAM/CAE		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 96 hours/semester	
Course aim	Implementation of modern 3D systems for geometric form generation, construction parameters analysis and preparation of computer aided manufacturing.		

Course description	Overview of computer aided design and manufacturing. Computer aided design (CAD) and computer aided manufacturing (CAM) components, hardware and software. Concept of CAD: three-dimensional (3D) modeling, virtual modeling, integrated quality control. Interface between CAM and CAD. Fundamentals of CAM. Computer aided engineering.
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MEMKB17166	DESIGN OF MACHINES AND INSTRUMENTS 1		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 33 hours/semester	
Course aim	To get acquainted with methods of the design of machines and instruments, allowing to get required force and speed characteristics of the machine, with designing of precise mechanisms, mechanism of summing of motions, traction mechanisms, particularities of mechanisms of instruments. Develop skills to apply this knowledge to the selection of main machine and instrument components and assemblies.		
Course description	Machine design process. Selection of motors. Methods of design of drives. Design of gear boxes. Design of spindles, using various bearings: sliding bearings (hydrodynamic type, hydrostatic type), rolling bearings. Design of summing of motions mechanisms, traction mechanisms. Particularities of design of instruments.		

MEMKB17433	DESIGN OF TECHNOLOGICAL EQUIPMENT IN CAD/CAM SYSTEMS. COMPLEX PROJECT		6 ECTS
Lectures – N/A	Practical works – 60 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 96 hours/semester	
Course aim	To teach the specialist how to use CAD/CAM/CAE software to design and manufacture technological clamping devices used in machining operations.		
Course description	The module helps the students to deepen their practical engineering skills using computer software to design and manufacture technological clamping devices.		

MEMKB22604	DESIGN OF TOOLS AND DEVICES (WITH COURSE WORK)		6 ECTS
Lectures – 40 hours/semester	Practical works – 10 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 10 hours/semester		Individual work – 96 hours/semester	

Course aim	Acknowledge with design schemes, materials, use, calculation and design of tools and devices, theory of their qualityachievement.
Course description	Design of cutting tools. Calculation and design of specialized cutting-edged tools. Characteristics and use of abrasive tools.Design schemes of specialized devices, their use, design elements of devises, calculation and design of devices, accuracyssecuring.

MEMKB17168	ECOLOGICAL DESIGN		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	
Course aim	Learn the rational use of material and energy resources in the design of new products that their operation would have the lowest impact on the environment, using the minimum amount of energy. To get knowledge about automation of technical systems and processes, to learn to analyze, to choose and to design the means of automation.		
Course description	The material properties of ecological assessment. Clean production process for the design of new facilities. Material and energy cost reduction in the production process. Device design optimization, reducing their performance and recovery costs. Understanding of the technical system, and the human role in it. Understanding about technical system and human role in it. Social result of automation. Automation influence to technologic processes. Peculiarities of design of technologic processes. Robots and their role in manufacturing. Automation of technologic processes.		

MERSB17109	ELEMENTS OF MECHATRONICS		3 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 33 hours/semester	
Course aim	Introducing students with elements of mechatronic systems and their interaction. Joint of components of different physical nature to united mechatronic systems.		
Course description	Overview of elements of mechatronic systems, main their types. Properties of elements of mechatronic systems having different physical nature. Drives ant their systems, power elements. Sensors - from physical properties to data. Mechanical and structural elements. Definition of parameters of elements using theoretical and experimental methods.		

MEMKB17239		EQUIPMENT ASSEMBLY TECHNOLOGIES		3 ECTS
Lectures – 24 hours/semester		Practical works – 12 hours/semester		Consultations – 2 hours/semester
Laboratory works – N/A			Individual work – 42 hours/semester	
Course aim	To provide knowledge of various equipment assembling technologies as well as devices and means usable.			
Course description	Fundamental of accuracy achievement in assembly. Methods of assembly organization. Technological preparation. Division of an equipment into units, junctions, subjunctions. Assembly and control of typical connections and junctions. Mechanisation and automatization of assembly works. Comparison of economical efficiency of different processes of assembly.			

MEMKB17255		FUNDAMENTALS OF INNOVATION MANAGEMENT		3 ECTS
Lectures – 24 hours/semester		Practical works – 12 hours/semester		Consultations – 2 hours/semester
Laboratory works – N/A			Individual work – 42 hours/semester	
Course aim	The course aims to provide students with the knowledge and skills necessary for innovation development.			
Course description	This module presents key concepts and principles of innovation and innovation management process, innovation classification, creativity stimulation tools and methods, ideas generation and evaluation process, management of innovation development team, development of innovation project, sources of innovation financing, innovation commercialisation process, intellectual property rights, licencing.			

MERSB17401		MACHINE ELEMENTS (WITH COURSE PROJECT)		6 ECTS
Lectures – 30 hours/semester		Practical works – 30 hours/semester		Consultations – 4 hours/semester
Laboratory works – 15 hours/semester			Individual work – 81 hours/semester	
Course aim	Introduction to machine elements and various joints of them.			
Course description	Machine elements. The criteria of operation. Joints of elements. Welded, pressed, riveted, glued joints. Thread, wedged shaped, splined, pin joints (connections). Friction drives. Belt drives. Gear drives: cylindrical and conical gear drives. Worm gear drives. Shafts, bearings, couplings, sealing and lubricating equipment. Laboratory works. The course project.			

MERSB17113	MECHATRONIC SYSTEMS 2		6 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 96 hours/semester	
Course aim	Introducing students with control of mechatronic systems. Control of discreet, continuous and proportional systems.		
Course description	Overview of mechatronic systems control, types of controllers. Different types of mechatronic systems. Synthesis of desired properties in mechatronic system design. Parameters of control of different types of mechatronic systems, dynamics of mechatronic system control. Design of real systems using digital modeling without solving differential equations analytically.		

MEMKB17180	PRODUCTION TECHNOLOGIES		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	
Course aim	To prepare the specialist which according to drawings of machine parts and their specifications would rightly understand processes of their production and itself could create, select, and improve technological processes of their production thanks to which quality of a machine and its parts would be achieved with a minimal cost.		
Course description	Production and technological processes, operations, their division to separate parts. Machine as production object. Specifications of a machine and its parts, their research, methods of quality assurance. Design and rating of technological process of parts production. Evaluation of effectiveness of technological process Processes plans for production of machine parts of different types. Documentation of technological processes. Creation of operation programs.		

MERSB17121	QUALITY AND CERTIFICATION IN THE AUTOMATED INDUSTRY		6 ECTS
Lectures – 24 hours/semester	Practical works – 12 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 12 hours/semester		Individual work – 108 hours/semester	
Course aim	To get acquainted with the system of quality management and automated production conditions.		
Course description	The module introduces the concept of quality, the quality assurance system and its components and the functioning of the quality management process.		

MEMKB17167	QUALITY MANAGEMENT		3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 33 hours/semester	
Course aim	To give knowledge about terms of quality and indexes, systems, control of quality, administration of quality and quality of marketing. To determine what is dependence between quality of product and price.		
Course description	Conception of quality, prime rates of quality. Terms and descriptions. System of quality and its structure. Requirements and principles of quality system. Control of quality, administration of quality. Methods of quality control. Planning and organization of quality control. Methods of productions presentation for control. Internal audit of quality, its organization and planning. Methodology of quality audit. Concepts and terms of marketing. Requirements of quality for marketing. Quality of marketing. Price of quality and its optimization.		

MERSB17114	ROBOTICAL TECHNOLOGY		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	
Course aim	To familiarize students with the practical application of industrial robots, typical robotic solutions and the latest software packages used for these purposes.		
Course description	Introduction. Main tasks. Practical and economic aspects. Areas of application. Micro robotics. Nano systems. Widely used robotic systems and specific of application. Optical recognition tasks and applications. Methods of robotic systems integration. Programming of industrial robots. Languages and systems. Levels of robot programming. Problems related with robot programming. Recommended solutions. Off-line industrial robotic programming systems. Technical requirements for CAD/CAM models. Practical aspects of TCP control scenario. Tool control task. Commonly used robotic systems. Technical and practical aspects robotic systems. Commonly used robotic system control software. Recommendations for practical applications.		

MEMKB17156	THEORY AND PRACTICE OF MEASUREMENTS (WITH COURSE PROJECT)		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	

Course aim	To get acquainted with the theory and practice of measurements. General knowledge of the technologies required in mechanical engineering. knowledge of the laws of engineering mechanics, the principles of applied mechanics, designing of mechanisms, appliances, devices and apparatus, mathematical methods and laws applicable for description, analysis and designing of the objects of production in mechanical engineering.
Course description	Rudiment of metrology and measurement theory. The principles of statistical measurement theory. Transformation of measurement signals. Measuring instruments and methods. Measurement of process parameters.

MEMKB17238	TRIBOLOGY		3 ECTS
Lectures – 24 hours/semester	Practical works – 12 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 42 hours/semester	
Course aim	To familiarize with mechanisms of friction and wear processes that proceeds in the components of machines.		
Course description	General conceptions. Principles of tribology. Friction. Wear. Lubrication.		

MEBIM17067	BIOFLUID MECHANICS		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 115 hours/semester	
Course aim	To introduce the concepts of biofluids, their properties and differences from other fluids.		
Course description	The course is dedicated to familiarizing with the features of biofluids, investigating their differences from other fluids, and analyzing biofluid statics and dynamics. During this course, the blood flow is analyzed and modeled. A great attention is paid to the phenomena of the blood flow in the pathological blood vessels.		

MEBIM17066	BIOSIGNALS ANALYSIS AND RECOGNITION		9 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – N/A	
Laboratory works – 15 hours/semester		Individual work – 180 hours/semester	
Course aim	Introduce students to features, measuring and processing methods of biosignals, their analysis and application in practice.		

Course description	Biosignal concept, origin, relation to biological system. Classification of biosignals and their characteristics. Biosignal measuring tools and processing methods. Biosignal measurement methods: Electrocardiography, Electromyography, Electroencephalography, Electroelectrolysis, Electroethanography, Magnetocardiography, Magnetonephalography and others. Noise reduction ways in medicine. The latest research in the field of biosignal analysis.
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MERSM17162	CONTROL OF MECHATRONIC SYSTEMS		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 115 hours/semester	
Course aim	To give knowledge on mechatronical systems control theory, signals and control implementation using computer(controller) based data acquisition and control systems, to explain the methods of control systems analysis and synthesis, to give knowledge on adaptive control systems and neural networks.		
Course description	Continuous time and discrete time systems, control algorithms, direct and closed loop control, system analysis, Laplace, Fourier and "z" transforms, signals, adaptive control, neural networks, computer based data acquisition and control devices.		

MEMKM17350	DESIGN OF MECHANICAL SYSTEMS (WITH COURSE PROJECT)		12 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – 15 hours/semester	
Laboratory works – N/A		Individual work – 245 hours/semester	
Course aim	To get acquainted with the structure of mechanical systems, their constituent parts, methods of estimation of the mechanical part of system during the analysis of mechanical system operation. To get acquainted with simulation of mechanical systems. To get acquainted with the structure, principles of their creation, calculations, which are performed during the designing, sensors used in systems, actuators, control systems. To present information.		
Course description	Mechanical elements, structure, principles of design, components of mechanical systems. Constituent parts of manipulators, their structure and composition principles. Determination of positioning accuracy. Direct and inverse kinematic problems of manipulators, the velocity problem, problems of static forces, dynamic problems. The mechanical systems, their execution systems and their strength calculations. Grippers and principles of their calculations. Sensors, control systems.		

MERSM17163		DIAGNOSTICS IN MECHATRONICS		6 ECTS
Lectures – N/A		Practical works – N/A		Consultations – N/A
Laboratory works – N/A			Individual work – N/A	
Course aim	To deliver knowledge about structure of mechatronic systems, to introduce with diagnostic equipment and their implementation methods of such systems.			
Course description	Provides information about the structure of mechatronics systems, methods of structure investigation and diagnostics of failures. Provides an overview of diagnostic equipment, introduces the circumstances of potential fault location of mechatronic systems. A description of the course of diagnostic testing of mechatronic systems is provided.			

MEMKM20203		EXPERIMENTAL MECHANICS		6 ECTS
Lectures – 15 hours/semester		Practical works – N/A		Consultations – 15 hours/semester
Laboratory works – 15 hours/semester			Individual work – 115 hours/semester	
Course aim	To acknowledge with new methods and means of research of mechanical systems.			
Course description	Tasks of experimental mechanics. Methods of measurements and analysis of different mechanical. Tensometry. Polarisation - optical method of stress research. Application of holography. Method of Muar strokes. Thermal elasticity. Methods of nondestructive check, experimental analysis of vibrations.			

MEMKM18201		INDUSTRIAL ORGANISATION AND STRATEGIC MANAGEMENT		6 ECTS
Lectures – 23 hours/semester		Practical works – 22 hours/semester		Consultations – N/A
Laboratory works – N/A			Individual work – 115 hours/semester	
Course aim	To provide theoretical and practical knowledge in the field of industrial business organization and strategic management.			
Course description	Theoretical part of the study course provides basics of microeconomics, overview of market power and dominant companies, static and dynamic games, Cournot' and Bertrand' oligopolies introduces panel modeling using the Eviews program, introduces collusive strategies and dynamic models of oligopoly, product differentiation and price discrimination strategies, Stackelberg' oligopoly, Dixit' model, peculiarities of strategic analysis of entry barriers, Fudenberg & Tirole framework, entry deterrence and accommodation strategies, quality and reputation strategies, Signal theory, advertising, R&D, exclusive, predatory and M&A strategies. In the practical part, the knowledge provided in the theoretical part is consolidated on the basis of team work.			

MEBIM17069		INFORMATION SYSTEMS IN MEDICINE		6 ECTS
Lectures – 15 hours/semester		Practical works – 15 hours/semester		Consultations – 15 hours/semester
Laboratory works – N/A			Individual work – 115 hours/semester	
Course aim	Introduce to hospital information systems, their function and state, algorithms of medical diagnostics and software.			
Course description	Hospital information systems, their functions. Computer networks in health-care institutions. Health care information infrastructure standards. Electronic health fundamentals. Electronic patient records. Clinical data, information types, modern technologies. Patient databases, data acquisition. Medical reasoning and medical knowledge. Statistic decision theory and signal processing in medical diagnostics. Artificial neural networks - characteristics, methods, algorithms and applications. Clinical decision support systems, types, application areas.			

MEMKM17357		INNOVATION STRATEGY AND TACTICS		6 ECTS
Lectures – 30 hours/semester		Practical works – 15 hours/semester		Consultations – N/A
Laboratory works – N/A			Individual work – 115 hours/semester	
Course aim	The course aims to provide students with the knowledge and skills necessary for innovation development. To learn patterns and peculiarities of innovation management, to be able to analyze innovation processes, and to be able to develop organization's innovation strategy and perform tactical solutions.			
Course description	The students, at the end of the course, will get knowledges on innovation development and its impact on society and economic growth, They will understand innovation in context of digital economy development, relationships between innovation and R&D. dynamics of understanding of innovation. The students will also learn linear model and nonlinear innovation development models such as Stage-gate, Toyota/Oobeya, Design thinking, System innovation, technological products develop methods and develop skills how to use them for innovation development. The module presents innovation development strategies, concept of open innovation, creativity flow theory for innovation development, ideas generation and evaluation methods, the Progress principle. The students will learn how to develop product innovations, to prepare innovation projects and to create prototypes.			

MEMKM17358		MANUFACTURING SIMULATION AND INDUSTRIAL PRODUCTION SYSTEMS		6 ECTS
Lectures – 15 hours/semester		Practical works – 30 hours/semester		Consultations – N/A
Laboratory works – N/A			Individual work – 115 hours/semester	

Course aim	To acknowledge with principles of process, especially random, simulation and with manual and computer simulation, and simulation programs. Acknowledge with different manufacturing processes simulation, their features and optimization. Introduce with objectives, tasks, designing of information systems of production management also with enterprise resource planning system.
Course description	Simulation. Models of discrete and random processes, forming principles of random process models on the samples of computer simulation by the use of "Arena" program facilities. Comparing of model and system structure, analysis of results. Machining operations simulation, safeguarding of their productivity simulation and optimization. Procedures and basic principles of work flow of manufacturing companies. General economic and manufacturing KPI's. Compatibility of information systems of production management with modern production strategies. Basic rules and planning of technological resources and human resources. Production management decisions' economic evaluation and modeling. Integration of sales, supply chain and financial procedures into manufacturing.

MEMKM17352	MARKETING OF INNOVATIVE PRODUCTS AND INVESTMENT MANAGEMENT (WITH COURSE WORK)		9 ECTS
Lectures – 30 hours/semester	Practical works – 30 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 180 hours/semester	
Course aim	Provide knowledge and develop students' skills in innovative product marketing and investment management.		
Course description	Marketing of innovative product and investment management course covers marketing of innovative products and its process, industrial activities and competitors, quantitative and qualitative demand analysis, innovative product marketing planning, strategy and development, marketing strategic decisions and marketing mix of innovative product, industrial and consumer markets similarities and differences, retailing and international marketing of innovative product, marketing of innovative product in internet; as well as investment management concept and investment planning, investment appraisal methods, financial sources of investment and company's borrowing capacity assessment, investment climate.		

MERSM17176	MASTER GRADUATION THESIS 4		30 ECTS
Preparation for evaluation – N/A		Final thesis – N/A	
Course aim	To develop wide erudition, ability to observe and critically analyze, investigate and creatively solve technical, administrative and juridical problems of design, manufacturing and maintenance questions for mechanics and mechatronical systems in global market conditions, understand influence and importance of made solutions in to society evolution, constantly improve professional skills when learning whole life.		

Course description	Information forthcoming from earlier modules last processing, application of suitable software, result presenting, conclusions and recommendations. Preparation of final work, report in conference, defense.
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MEBIM17070	METHODS OF BIOTECHNICAL SYSTEMS AND MEDICAL DIAGNOSTIC		6 ECTS
Lectures – 30 hours/semester	Practical works – N/A	Consultations – 15 hours/semester	
Laboratory works – N/A		Individual work – 115 hours/semester	
Course aim	Provided knowledge about the failure search methods, statistical method in diagnostics, diagnostics information's collections methods, medical diagnostics features.		
Course description	Diagnostic models: functional model, structural model. Diagnostics of medical devices. Statistics methods of diagnostics theory: Baes' method, statistical decision methods. diagnostics information's collections methods, medical diagnostics methods.		

MERSM17166	MODELLING OF MECHATRONIC SYSTEMS		9 ECTS
Lectures – 45 hours/semester	Practical works – 15 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 180 hours/semester	
Course aim	Introducing students with various methods of mechatronic system modelling.		
Course description	Methods of modelling. Analysis of mechatronic systems on basis of their modelling possibility. Modelling of components of mechatronic systems. Jointed mechatronic systems, influence of control. Synthesizing of new mechatronic systems with desired properties in case of modelling new systems.		

MERSM17165	SENSORS IN MECHATRONICS		6 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – N/A	
Laboratory works – N/A		Individual work – 115 hours/semester	
Course aim	To introduce with design features of sensors and their implementation in mechatronics.		
Course description	There are delivered detailed overview of sensors in mechatronics. Detailed description of their design features, methods and possibilities of their implementation in mechatronics. There are discussed possibilities of sensor design and enhancement.		

MEMKM20201	THEORY OF ENGINEERING EXPERIMENT (WITH COURSE WORK)		6 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 15 hours/semester	
Laboratory works – N/A		Individual work – 115 hours/semester	
Course aim	To acknowledge with fundamentals of experiment planning, give knowledge about correlation of the real experiment and theoretical generalization and also about computerized data processing. To acquire the competence to compare theoretical and experimental results.		
Course description	Engineering experiment, errors and uncertainties of experiment, selection of variables, continuity of experiments and plan of experiment, statistical analysis of data, computer packages, control and analysis of experiment.		

TRANSPORT ENGINEERING FACULTY

TIAIB17053	AUTOMOTIVE THEORY		6 ECTS
Lectures – 45 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	
Course aim	To familiarize students with the forces operating in a moving car, the traction, braking, manageability, stability, uniformity of the movement, fuel economy and exploitation features.		
Course description	The purpose of car theory. The forces acting on the car. Vehicle dynamics. Vehicle steerability. Vehicle stability. Vehicle cross-country ability. Vehicle exploitation economy.		

TIAIB17054	AUTOMOTIVE THEORY (COURSE WORK)		3 ECTS
Lectures – N/A	Practical works – 30 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 48 hours/semester	

Course aim	To learn to apply self-dependently the obtained theoretical knowledge, which is necessary in practical use for solution of the car theory problems, to be able to evaluate forces, acting the car in motion, to be able to calculate them and to analyse the created dependencies.
Course description	Evaluation of forces acting on the car. Creation of the traction power dependence on car speed. Calculation of resistances to car motion. Calculation of the car dynamic factor and car acceleration. Creation of the power balance. Calculation of car stability. Creation of dependencies of the car braking distance and braking time on speed. Evaluation of efficiency of the car fuels.

TIMGB17119	DESIGN FUNDAMENTALS		3 ECTS
Lectures – 15 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 33 hours/semester	
Course aim	To acquaint the students with the main product design stages, general methods for designing and assessing products, the unified system of product construction documentation, standards and innovative activities.		
Course description	The information about the process of design, its stages and general methods of product design, construction and assessment as well as the unified system of product construction documentation is provided. General knowledge about standards, innovative activities and patents is given. Students are also acquainted with modular building and computer design of products.		

TIAIB17036	STRUCTURAL AND EXPLOITATIONAL MATERIALS OF ROAD VEHICLES		6 ECTS
Lectures – 45 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	
Course aim	To provide knowledge for students about vehicle construction and operational use materials, classification, chemical composition, physical and chemical properties, operating conditions, work with their security features.		
Course description	Fuel, oil, gaseous fuels and their production. Their physical-chemical properties, the influence of vehicle reliability and longevity. Storage. Plastics, rubber, metals, wood, glue, glass. Their composition, types, production, physical-chemical properties application in transport. Technical fluids.		

TIMGB17031	TECHNOLOGIES OF VEHICLE PRODUCTION AND REPAIR		3 ECTS
Lectures – 30 hours/semester	Practical works – 15 hours/semester	Consultations – 2 hours/semester	
Laboratory works – N/A		Individual work – 33 hours/semester	
Course aim	Consistent patterns of technological processes and basics of their formation.		
Course description	Basics of technologies of vehicles production and repair. Typical and special technologies in production and repair of vehicles' parts.		

TILTB16717	TRANSPORT MANAGEMENT (ORGANIZATION) (WITH COURSE WORK)		6 ECTS
Lectures – 45 hours/semester	Practical works – 15 hours/semester	Consultations – 4 hours/semester	
Laboratory works – N/A		Individual work – 96 hours/semester	
Course aim	Provide theoretical knowledge and practical skills about Transport system and functioning of its separate elements. Provide knowledge about organization of diverse activities within Transport Enterprises in order for students to become marketable in Transport Service Business upon completion of their studies.		
Course description	Transport management (organization) subject module is designed to provide students with theoretical knowledge about the structure of transport system and its functioning peculiarities. Transport business organization, planning and management. To familiarize students with separate modes of passenger and freight transportation technologies; to ascertain the impact of transport management on economic and social life. To provide practical skills connected with transport business, legislation, reduction of damaging outcomes of Transport activities.		

TIAIB17058	VEHICLES DESIGN		6 ECTS
Lectures – 45 hours/semester	Practical works – N/A	Consultations – 4 hours/semester	
Laboratory works – 15 hours/semester		Individual work – 96 hours/semester	
Course aim	Analysis of the main units of automobiles, their destination, classification, structure and working peculiarities. Develop skills to apply this knowledge to the selection of main car components and assemblies. Design and calculations of their main units and parts.		
Course description	Available a historical overview of car components, its development, types currently in use, schemes, analysis of construction and operation. Further there are analysed their structure, interaction and operation, reviewed their characteristics and design. The presented material is aplenty illustrated with figures, diagrams and graphs.		