Syllabus part 1

General characteristics of the study	
Organisational unit responsible for the area (specialisation) of study:	**Institute of Construction and Engineering Design**
Area (specialisation) of study *(name of the area (specialisation) must be adequate to the contents of the study syllabus, especially to the expected learning outcomes)*	**Civil Engineering**
Level of education: *(first-cycle degree, second-cycle degree, long-cycle Master's degree programmes)*	**the first**
Educational profile: *(general academic profile, practical profile)*	**practical**
Form of study: *(full-time programme, part-time programme)* **Optional field specific study (e.g. e-learning, dual)**	**full-time**
Number of semesters:	**7**
Practical training (total):	**960 hours within the first 7 semesters**
OHS training consisting of:	**4 hours in the beginning of the 1 semester as part of the Work Safety and Ergonomics Module**
Number of ECTS credits necessary for achieving qualifications corresponding to the level of study	**210**
Total number of ECTS credits obtained:	
for classes requiring direct involvement of university teachers or other persons conducting the classes:	**177,5**
for classes in the field of humanities and social sciences:	**13,5**
for practical training:	**32,5**
for modules of classes associated with professional practice preparation:	**131,5**
for classes conducted remotely (applies to e-learning);	
Percentage of ECTS credits for each scientific discipline *(applies to the field of study related to more than one scientific discipline):*	
leading discipline: civil and transport engineering	**100% of the total number of ECTS credits**
discipline (disciplines):	
Total student workload	**5471**
Degree awarded to the graduate:	**engineer**
Indication, whether the stakeholders' opinions have been considered in the process of defining the learning outcomes and the process of development and improvement of the curriculum *(provide information about contracts signed with employers, meetings held; graduate follow-up, etc.)*	**contracts and agreements: GOTOWSKI Budownictwo Komunikacyjne i Przemysłowe Sp. z o.o., Kujawsko-Pomorska Okręgowa Izba Inżynierów Budownictwa, DOMPOL Sp. z o.o., Baumat Sp. z o.o., Pomorsko-Kujawska Izba Budownictwa, ARKADIA Sp. z o.o., AEC DESIGN Sp. z o.o., Spółdzielnia mieszkaniowa „Budowlani", Polski Związek Inżynierów i Techników Budownictwa. Fate of graduates based on their own contacts**
Initial requirements *(the expected qualifications of a candidate - especially in the case of second-cycle studies)*	**secondary school completed and matriculation certificate obtained**
Area (specialisation) - field of study relationship	**construction**

Syllabus part 2

Area: **Civil Engineering**

Study modules including the expected learning outcomes

Study modules	Courses (* - means that a course is optional/facultative)	Expected learning outcomes	Curriculum content ensuring the achievement of learning outcomes	Evaluation method	Number of ECTS credits	Methods of verification of the expected learning outcomes of the student
Canon subjects						
Selected issues from economics and business	Selected issues from economics and business	K_W16, K_U01, K_K01, K_K04	Selected elements of marketing; Selected elements concerning organisational culture of a company; Selected elements of economic analysis; Business plan using the LEAN Canvas method	Pass	1	Test on the e-learning platform, writing assignments, teacher and peer assessment
Library Training	Library Training	K_W17, K_U01, K_U05, K_K01	WSG information and library system; WSG Master Library (or branches) and its online collections; Online catalogues; Making collections available; Databases	Pass	0	Test on a remote learning platform
Safety and ergonomics at work	OHS training	K_W13, K_W14, K_W16, K_W18, K_U18, K_K02, K_K06	Characteristics of the work protection system in Poland; Scope of OHS activity and definition of basic concepts in the field of OHS; Rules of fire protection and employer's obligations in this scope; Characteristics of fire safety requirements; Characteristics of main elements of environmental protection; Basic issues related to pollution; Characteristics of activities related to utilisation, recycling and biodegradation; Activities related to shaping of: the spatial structure of the work station, lighting and colours of the work environment; Elements of the system of control and supervision over legal OSH protection in workplaces	Pass	0	Tests on the e-learning platform
Basics of law and intellectual property protection	Basics of law and intellectual property protection	K_W13, K_W1, K_W17, K_U01, K_U18, K_K02, K_K05	The concept of law and its functions; Concepts, legal system and other normative systems; System of law and legal norm; Standards and legal regulations; Creation of law and hierarchy of legal sources; Application and interpretation of law; Characteristics of basic branches of law; Intellectual property and its place in the legal system; Copyrights and proprietary copyrights; Protection of industrial property; Utility models, industrial designs, trademarks; Topography of integrated circuits, rationalisation projects, geographical indications	Credit with a grade	1	Test on a remote learning platform
Modern technologies	Practical basics for remote learning	K_W19, K_U05, K_K01	Lifelong learning – pace of changes in the surrounding world, methods of professional self-improvement; Security of IT systems – logging in to WSG systems, elements of network security; working with the LMS system – places where information appears, sources of knowledge, methods of activation, methods of communication, ways of verifying learning outcomes	Pass	0	Tests, surveys, forum discussion
Key social competencies	Inclusive education	K_K02, K_K03	The specificity of Polish and European culture compared to the cultures of other countries and continents; The specificity of the functioning of the academic culture in order to adapt students	Z	0	Multimedia presentation
	Reginalism	K_W16, K_U01, K_K01	definitions of regionalism, regional identity, local identity, historical conditions of regionalist movements, region as the basis for social and cultural identification, social role of regionalists, historical conditions for the creation of regional and local cultural heritage, regional and local heritage in the creation of a local tourist product, strengthening regional identity in the activities of local governments, a selected issue from the history of the formation of Polish regions, regionalism in the cultural policy of the European Union, regionalism as the endogenous potential of the Kuyavian-Pomeranian Voivodeship, support systems for endogenous potentials in the context of the 1st congress of regionalists of Kujawy and Pomerania	Pass	2	Tasks completed during classes ,homework, attendance, activities in classes - debates or written work
	Cultures of the World	K_W16, K_U02, K_U05, K_K02	I. Basic issues in the field of cultural knowledge; discussion of representative concepts of culture; "history" of culture - presentation of selected concepts regarding the emergence of the cultural phenomenon. II. The concept of civilization; discussion of basic theories regarding the formation of civilization and mutual relations between civilization and culture on the example of selected world cultures. III. Cultural criticism; historical aspects of the concept of "culture and power" on the example of post-colonialism. Relations, hegemonies, social inequalities in correlation to world cultures. Diversity of cultures and their dynamics. The concept of "cultural circle" and the axiological core and the concept of subculture. IV. Determinants of cultural identity and defining its essence; ethnicity and nationality. V. Magic, ritual and religion. VI. Europe as a political, ideological, cultural "concept" and as a way of thinking - its statics and dynamics. Other homogeneous, homeostatic and heterogeneous culture systems in terms of their expansion.	Pass	1	Discussion during lectures, active participation in games and debates, Final assessment with a positive result, Online test
	Foreign language	K_W16, K_U01, K_U03, K_U06, K_K01	**English:** Employees, job and position names; job activities and responsibilities; business profile; product and service description; vocabulary related to sales and purchasing, services, expressions used when filing complaints; manufacturing process, stages; team building, employee relationships, relationship with the supervisor; policies and regulations; forms of employment, self-employment; initial meetings and greetings; telephone conversations; creating a company logo and image; time management; business meetings and assemblies, teleconferences and video conferences; delegation of tasks and responsibilities; professional experience, professional achievements, labour market; recruitment process, job interviews, professional careers; advertising of products and services; technical specifications of the product; the appearance and design of the product, goods of everyday use and buildings; work clothing, clothes and fashion; appearance and clothing, adjectives describing the character and personality, personality traits useful at work; use of various means of transport, commuting; a description of the place of residence, large and attractive cities, life, problems and leisure time in the city; travel, tourist information, business travel, accommodation, travel problems, in the hotel; tours, sightseeing, sense of direction, tourist attractions; cultural heritage, intercultural communication, culture shock; cultural, entertainment, leisure and corporate events, fairs and exhibitions, events; work abroad; hobbies, vocabulary related to leisure activities; meals, eating habits, diets, preparing and ordering meals and drinks, dining out; changes in lifestyle and work style, their pace and impact on humans, maintaining a balance between private and professional life, being assertive; vocabulary related to discoveries and inventions; innovation and technological solutions, names of electronic devices and gadgets, vocabulary related to the use of electronic devices and the Internet, information and communication technologies, social media, their business use, social media professional profile; network security; vocabulary related to eco-friendly actions, threats to the environment and environment protection, use of water, electricity; money and finance, saving and spending money, financial settlements; describing patterns, trends, and changes, causation; describing charts; public speeches, presentation elements, successful and failed presentations	Credit with a grade	6	Written assignment Grammar test; Vocabulary test; Speaking; participation in discussions; role play; tasks to understand written texts; tasks to understand spoken texts; performing tasks in language modules on the learning platform
		K_W16, K_U01, K_U03, K_U05, K_U06, K_K01	**German:** Celebrating with colleagues; What can you gift?; All planned well; New apartment; Where to put things?: wohin?; Where things are placed?: wo?; Learning to be ...; How did it happen?: narrating; Presentation of a company; Hotline-office; Customer service; Complaints; Services; Our order for you; We manage your building; Business travel to ...; Touring the city; In a hotel reception; Advertising article; Advertising; What is your offer?; Dresscode; Retraining and further education; Time for a meeting; Business meetings; Industries and products; Economic sectors; Work and health; Sick leave at work; Companies introduce themselves; What is the legal form?; Leaving a message; Planning a trade fair; Trade fairs in Germany; Processing an order; Guarantee and warranty; Issuing a bill; Conflict in the team; Good interpersonal communication; Giving leave; Advising clients; Getting clients; Job offer; Job search; CV; Interview; Working time models; Employment contract; Trade in transition; Internal communication; Stock market and share price; Insurance system in Germany; New product and advertising strategies; When a project fails.: ways to resolve conflicts; My rights at work; Fighting or cooperating?; Communication routes; Transport calculations; Understanding international business conditions	Credit with a grade		
		K_W16, K_U01, K_U03, K_U05, K_U06, K_K01	**Russian:** Employees, names of professions and positions; scope of activities and duties; business profile; description of products and services; vocabulary related to sale and purchase, services, expressions for making complaints; forms of employment, conducting one's own business activity; first meetings and welcomes; telephone conversations; creating company logos and image; time management; meetings, telephone and video conferences; professional experience, professional achievements, labour market; recruitment process, interviews, professional career; human: external appearance, personality traits, emotions, health, family, social life, leisure time, food; human environment: home and equipment, city, countryside, school and work; entertainment and leisure: books, cinema, theatre, music, art, exhibitions, museums, media; travel: tourism, means of transport; sport and sporting disciplines; education; health: body parts, illnesses, medical insurance, visiting the doctor; work: job offers, recruitment, job interviews, job descriptions; shopping and services; foreign languages; information and communication technology; natural world: weather, natural disasters, environmental protection, fauna and flora; state and society: law and crime, social norms, social and economic problems.	Credit with a grade		

Syllabus part 2

Area: **Civil Engineering**

		Study modules including the expected learning outcomes				
Foreign language	Specialist foreign language	K_W16, K_U01, K_U03, K_U04, K_U05, K_U06, K_K01	English: Materials Quiz 1 Building materials Quiz 2 Material properties Quiz 3 Material properties Planning, designing and construction Quiz 1 Common structural elements and types of load Quiz 2 Common structural elements and types of load Quiz 3 Design and planning – forms of presentation Quiz 4 Computer Aided Design (CAD) – stages Quiz 5 Before construction starts Quiz 6 Construction industry sectors Buildings Quiz 1 Buildings, houses and homes Quiz 2 Parts of a building Quiz 3 House installation systems Quiz 4 Intelligent buildings – features Revitalization Quiz 1 Revitalization – definition and aims Quiz 2 Revitalization – basic terms Quiz 3 Dimensions of revitalization process Numbers, shapes and position Quiz 1 Shapes Quiz 2 Position and location Quiz 3 Mathematical symbols and operations Data analysis Quiz 1 Large numbers, fractions and decimals Quiz 2 Chart types Quiz 3 Chart analysis Quiz 4 Charts - describing trends and changes Quiz 5 Data analysis - charts Quiz 6 Data interpretation	Pass	2	correct completion of tests and tasks in the language modules on the ONTE platform
		K_W16, K_U01, K_U03, K_U04, K_U05, K_U06, K_K01	German: Teil 1 Untersuchungen Testaufgabe 1 Die Recherche-Werkzeuge – Übersetzung Quiz Testaufgabe 2 Die Recherche-Werkzeuge – Definitionen Quiz Testaufgabe 3 Die Recherche-Werkzeuge – Definitionen Quiz Testaufgabe 4 Die Recherche-Werkzeuge Quiz Teil 2 Datenanalyse Testaufgabe 1 Die Zahlen Quiz Testaufgabe 2 Die Diagrammtypen Quiz Testaufgabe 3 Die Interpretation von Diagrammen Quiz Testaufgabe 4 Die Interpretation von Diagrammen Quiz Testaufgabe 5 Ein Diagramm analysieren - so gehen Sie dabei vor Quiz Testaufgabe 6 Die Interpretation der Daten Quiz Teil 3 Ein Abstract / Zusammenfassung Testaufgabe 1 Die typische Phrasen Quiz Testaufgabe 2 Wann und wie kann man erfolgreich eine Fremdsprache beherrschen?-ein Abstract Quiz Testaufgabe 3 Wann und wie kann man erfolgreich eine Fremdsprache beherrschen?-Leseverständnis Quiz Testaufgabe 4 Abstract der Diplomarbeit- Leseverständnis Quiz Teil 4 Konferenzen Testaufgabe 1 Das Anmeldeformular zur Konferenz Quiz Testaufgabe 2 Die Tagesordnung einer Konferenz Quiz Testaufgabe 3 Die Teilnehmern der Konferenz Quiz Testaufgabe 4 Die Konferenzausstattung Quiz Testaufgabe 5 Die Konferenzausstattung Quiz Testaufgabe 6 Die Sitzordnung bei Konferenzen Quiz	Pass	2	correct completion of tests and tasks in the language modules on the ONTE platform
		K_W16, K_U01, K_U03, K_U04, K_U05, K_U06, K_K01	Russian: Исследования Quiz 1 Методы исследования Quiz 2 Методы исследования Quiz 3 Методы исследования Анализ данных Quiz 1 Числа, дроби Quiz 2 Виды диаграмм Quiz 3 Анализ диаграмм Quiz 4 Диаграммы - описание изменений Quiz 5 Диаграммы - описание изменений-чтение с пониманием Quiz 6 Интерпретация данных Тезисы Quiz 1 Фразы, употребляемые в кратких обзорах (аннотациях) Quiz 2 Аннотация Quiz 3 Аннотация Quiz 4 Аннотация-чтение с пониманием Конференции Quiz 1 Состав конференции Quiz 2 Техническое обеспечение конференции Quiz 3 Техническое обеспечение конференции Quiz 4 Способы оформления конференционного зала: расстановка столов			correct completion of tests and tasks in the language modules on the ONTE platform
Physical education	Physical education	K_W16, K_U01, K_K06	Team games; General development activities with basketball, volleyball, handball, football, unihockey elements; Fitness	Pass	0	Test; self-assessment, analysis, observation
Practical Philosophy	Ethics	K_W16, K_U02, K_U20, K_K02	Ethics as science; Teleologism in ethics; Moral standard; Individual as a source of morality; Conscience as a moral standard; Ethics against contemporary challenges	Credit with a grade	1	End-of-semester assignment - essay; exam
	Ethics of Artificial Intelligence	K_W16, K_U02, K_U20, K_K02	Introduction, or – on everything we need to know to get started Algorithms and how they rul)n our lives AI in popculture Moral Dilemmas and thought experiments in AI Current trends in AI research Machine consciousness, humor, emotions and... common sense.	Pass	1,5	Online test
Flexible education	Introduction to scientific information	K_W16, K_W17, K_W19, K_U01, K_K03	The concept of information and its application in science; Sources of scientific information; Catalogues and bibliographic databases; Scientific databases; Licensed online knowledge bases; Open repositories; Searching for information on the Internet; Use of thematic websites; Use of scientific search engines; Use of multi-search engines; Use of library information and search systems	Pass	1	Test on a remote learning platform
	First pre-medical aid	K_W16, K_U05, K_K01	Cardiopulmonary resuscitation (CPR) – algorithms of conduct; Injured party unconscious; Airway obstruction; Life threatening states related to nervous system. Symptoms and procedure; diseases and emergencies requiring assistance related to the respiratory and cardiovascular system. Symptoms and procedure; frostbite, thermal burns, chemical burns, electric shock; wound types and dressing, haemorrhages; motor organ, head, spine injuries; procedure for various life threatening situations and diseases. Symptoms and procedure	Pass	1	Test; tasks; observation of students' work during exercises, assessment and analysis of practical tasks performed
	Specialised IT systems	K_W11, K_U05, K_U09, K_U15, K_K01, K_K08	• Types of software used by civil engineers • Linking internal force calculations (according to theories) with dimensioning (according to standards). Compliance issues • Calculation of building structures with the aid of RW WIN or Robot Structural Analysis Professional	Pass	1	Laboratory classes - e-learning test, independent execution and (oral) defence of all individually assigned project exercises, ongoing consultations conducted during classes
	Culture of the Polish language	K_W16, K_U01, K_U02, K_U03, K_U06, K_K01	Training of listening, speaking, reading and writing skills as part of everyday life and basic social contacts – establishing and maintaining contacts in formal and informal situations, providing information about oneself, shopping, using catering, transport and accommodation services, expressing basic needs in the above-mentioned situations.	Credit with a grade	4	Written control tests, oral answers verifying grammar and vocabulary knowledge; written works as part of homework, work on classes; brief written statements; homework, work on classes, written control tests verifying reading skills; self-assessment, observation; evaluation of activity and engagement in classes, observation of work in pairs or groups
	English technical terminology in construction	K_W16, K_U03, K_U04, K_U05, K_U06, K_K01	Worksite safety and equipment 1. Safety equipment 2. Worksite safety Planning and designing 1. Floor plans 2. Prints 1 3. Prints 2 Excavation, foundations and concrete work 1. Excavation 2 2. Foundations 3. Concrete work 1 Timber, steel and concrete frames 1. Timber frames 2. Steel frames 3. Concrete frames	Pass	1	Workshop classes - test

Syllabus part 2

Area: **Civil Engineering**

		Study modules including the expected learning outcomes				
	Civil Engineering	K_W16, K_U03, K_U04, K_U05, K_U06, K_K01	Current problems in Civil Engineering	Pass	1,5	participation in discussion, oral answers to test knowledge of subject matter and construction vocabulary
	Information technologies	K_W11, K_W19, K_U01, K_U03, K_U04, K_U15, K_U23, K_K01, K_K08	• Word processor - principles for editing documents, principles for formatting documents, working with tables, serial correspondence • Excel spreadsheet - principles of entering and editing data in a spreadsheet, creating formulas, basic data aggregation functions • PowerPoint presentation software - principles for creating presentations, adding animation effects, using SmartArt objects, using themes, creating your own slide template.	Pass	2	Performance of practical tasks
Basic subjects	Construction chemistry	K_W01, K_U26, K_K02, K_K03	**E-learning classes** • Inorganic compounds -Stoichiometry of chemical formulae • Structure and properties of gases, liquids and solids -Gas laws • Fundamentals of chemical thermodynamics • Fundamentals of chemical kinetics and equilibrium • Water and aqueous solutions -Physical and chemical properties of water -Ways of expressing concentrations of solutions -Colloidal solutions, emulsions • Chemical reactions - Types of chemical reactions, -Hydration and hydrolysis reactions • Oxidation and reduction reactions -Corrosion of metals • Surface phenomena and their importance in construction • Chemistry of building materials -Bonding materials. Air and hydraulic binders. -Plastics and bituminous materials -Corrosion of cementitious plastics **Laboratory classes** • Kinetics and chemical equilibrium -The effect of temperature on the rate of a chemical reaction • Water and aqueous solutions -Preparation of solutions of different concentrations, study of conductivity of solutions • Analysis of water • Oxidation and reduction reactions -Testing of metal corrosion resistance and influence of inhibitors on corrosion rate • Chemistry of building materials -Determination of active calcium oxide in quicklime	Pass with a grade	2	Laboratory classes - completion of laboratory exercises, completion of a report on completed exercises, a test
	Engineering geology with soil mechanics	K_W07, U_U07, K_K02, K_K03, K_K09	**Laboratory classes** • Topic 1: Mineral identification, rock-forming minerals, rock identification, origin and structure of rocks, rock types, use of mineral and rock identification keys. • Topic 2: Rock substrate as ground suitable for foundation of civil structures. Use of rocks in construction (examples to be recognised). Soil formation. Calculation of soil parameters. Determination of stresses in the subsoil, calculation of subsidence of the subsoil. • Topic 3: Soil types - Division, properties, recognition based on morphological features. Macroscopic analysis of non-cohesive, cohesive and organic soils. • Topic 4: Soil structure- classification, properties and characteristics, recognition and description based on morphological features using keys for organoleptic evaluation. • Topic 5: Testing of the physical and mechanical properties of soils, i.e.: grain size, moisture content, maximum water capacity, bulk density, specific density, consistency limits, soil condition, compressibility, shear strength. • Topic 6: Tectonics, hydrology, geological maps. Fundamentals of hydrology. Capillary water uptake, infiltration rate, practical implementation of experiments. E-**learning classes:** • Earth structure, geological processes, basic geological forms. Land formation-glacial activity, seismic activity, erosion, aeolian processes.	Pass with a grade	3	e-learning test, handing in of reports, conversation during the classes initiated by the lecturer
	Mathematics	K_W01, K_U24, K_K01	**Lectures – semester I** • Matrices and vectors • Methods of solving linear algebraic equations • Limit of a sequence and limit of a function • Properties of functions • Derivative and differential of a single variable function • Investigation of the variation of a function • Derivative of a multivariable function (partial derivatives - how to calculate), • Application of derivatives in geometry and physics **Lectures – semester II** • Indefinite integral • Direct integration method • Integration by substitution, • Integration by parts, • Integration of rational functions • Integration of non-rational functions and of expressions containing trigonometric functions • Definite integral, • Determination of the area of a plane figure • Determination of the arc length of a curve • Determination of the area of a rotating figure • Double integral and triple integral **Classes – semester I** • Matrices (dimension, operations, properties of operations, construction of a row echelon matrix, examples of applications), • Determinants (notation, existence criteria, calculation methods, properties of determinants), • Row of a matrix (notation, methods of determination, row of a row echelon matrix), • Systems of linear equations (matrix notation of a system of linear equations, Cramer systems - Cramer's theorem, Gauss-Iordan elimination), definite, indefinite and contradictory systems, Kronecker-Capelle theorem -Solving non-Cramer systems of linear equations -Vector algebra (notation, operations on vectors - scalar product, vector product, mixed, linear dependence and independence of vectors, geometric and physical interpretation), • Function of one variable (argument of a function, value of a function, formulae, graphs, properties of elementary functions), • Limit of a number sequence (definition, interpretation, properties, methods of calculation, number e - definition and applications), • Limit of a function (proper and improper limits, continuity of a function – geometric interpretation), • Derivative of a function of one variable (notation, geometric interpretation, existence criteria, calculation of derivatives, application of the derivative to the study of monotonicity of a function, local extremum of a function, global extremum of a function), **Classes – semester II** • Indefinite integral of a function of one variable (ways of calculating the integral - substitution method, integration by parts, integration of measurable functions, integration of non-rational functions and expressions containing trigonometric functions), • Indefinite integral of a function of one variable (ways of calculating the definite integral, use of the singular integral to calculate the area of a plane figure, the arc length of a curve, the surface area of a rotating solid), • Integral calculus of functions of many variables (double integral as volume of a solid).	Exam / Pass with a grade	9	Lecture - exam Class - test
		K_W01, K_U25, K_K03	**E-learning** a. Vector calculus: • scalar, vector - application in physics; operations on vectors; scalar and vector products; coordinate systems b. Kinematics of a material point: • description of paths of motion in terms of the leading vector; concepts of velocity and acceleration; motion in a fixed plane; angular velocity and angular acceleration - circular motion c. Dynamics of a material point • reference systems, coordinate systems - vectors; Newton's three principles of dynamics; Newtonian description of gravity; reference systems - inertial and non-inertial • Solid dynamics d. The law of conservation of energy: Kinetic energy, potential energy, work; definition of work, kinetic energy, potential energy, power; conservation forces; The law of conservation of momentum and angular momentum. e. Gravity: • The law of universal gravitation; gravity versus the superposition principle; Earth's gravitational field; gravitational potential energy; Kepler's laws; planets and satellites; f. Elements of Thermodynamics: • temperature; principles of thermodynamics; temperature scales; thermal expansion; heat absorption; heat, work and energy; mechanisms of heat transfer; thermodynamic transformations g. Electric field and electric current • Electric field strength; Point charge in an electric field; Gauss's law; Conductors; Condensators; Electric current; Ohm's law; Kirchhoff's laws; Alternating current h. Geometrical optics: • Straightness of light rays; laws of reflection and refraction; dispersion of light; plane, concave, convex mirrors; images in mirrors; prism and light splitting; convex, concave lens i. Wave optics: • diffraction; interference; diffraction grating			

Syllabus part 2

Area: **Civil Engineering**

Study modules including the expected learning outcomes						
	Physics		**Laboratory classes:** j. Determination of the specific heat of water using an electric calorimeter • Specific heat; phase transitions ice-water-vapour; heat balance; Joule-Lentz heat (dissipated at a resistor during current flow); construction of the electrical calorimeter k. Determination of the speed of sound by the resonance method • notion of mechanical resonance; sound wave phenomenon; standing wave; wave parameters length, frequency, period; sound wave propagation l. Determination of diode characteristics • construction of a diode; characteristics of a rectifying diode; notion of electromotive force; Kirchhoff's and Ohm's laws; electrical meters - voltmeter and ammeter m. Determination of the RC constant, test for charging and discharging a capacitor • construction of a capacitor; principles of combining capacitors; notion of capacitance of a capacitor – formulae; graph of charging and discharging of a capacitor; exponential function – properties n. Determination of the viscosity index of liquids using a Stockes viscometer • Newton's laws of dynamics; the concept of viscosity of liquids; Archimedes' law; distribution of forces; mechanical resistance in liquids; operation of the micrometer screw o. Determination of the modulus of rigidity of a bar using a torsion pendulum • Newton's laws of dynamics; the concept of moment of inertia; Steiner's law; modulus of rigidity; harmonic oscillations p. Study of the harmonic oscillation of a spring, determination of the modulus of elasticity • Newton's laws of dynamics; modulus of elasticity; harmonic oscillations q. Testing the laws of mechanics using a slippery slope • Newton's laws of dynamics; distribution of forces; friction phenomenon; uniformly accelerated and decelerated motion r. Determination of the coefficient of friction • Newton's laws of dynamics; distribution of forces; friction phenomenon; uniformly accelerated and decelerated motion s. Investigation of the laws of geometrical optics, determination of the wavelength of light • laws of geometrical optics; the phenomenon of total internal reflection	Pass with a grade	1,5	E-learning - test, Laboratory classes - reports on performed experiments, written or oral test
	Theoretical mechanics	K_W01, K_W04, K_U01, K_U12, K_K03, K_K09	**Lecture** • Elementary knowledge of vector calculus, - Notion of scalar and vector, Addition of vectors, - Scalar product of vectors, Vector product of vectors, - Moment of force in relation to a point, Moment of force in relation to an axis • Basic concepts and principles of statics - Models of bodies in mechanics, - Force and its representation, - Static principles, - Force projection on the axis • General system of forces - Couple of forces. Parallel shift of force, - Reduction of the general system of forces, - Balance of the general system of forces, - Special cases of force systems • Statics of material systems - Degrees of freedom and ties, - Active and passive forces, - Support reactions in bar systems • Kinematic analysis of plane bar systems - Single and multiple joints, - Necessary and sufficient conditions for geometrically invariant flat systems, - Instantaneous variability of flat systems • Statically determinate flat trusses - General properties of trusses, basic assumptions, - Classification of trusses, determination of forces in truss members, - Node balancing method, Ritter's method **Workshop classes** • Kinematic analysis of structural systems • Determination of support reactions of statically determinate bar structures • Determination of internal forces in truss members • Solution of elementary tasks in material point kinematics and dynamics • Kinematic analysis of structural systems • Determination of support reactions of statically determinate bar structures • Determination of internal forces in truss members	Exam / Pass with a grade	5,5	Lecture - exam Workshop classes - test
	Calculation methods	K_W04, K_W11, K_U09, K_U13, K_K08	**a.Lecture** Fundamentals of matrix calculus, Definitions of specific matrix types, Matrix operations, Square matrix determinant, Inverse matrix, Systems of linear equations, Modelling of engineering problems, Real object, Physical model, Mathematical model, Local formulation, Global formulation, Mathematical model for a bent beam problem, Discrete modelling of a physical model, Discretisation methods for continuous physical models, Finite Element Method, Finite Difference Method, Boundary Element Method, Classical finite difference method, General comments on the method, Differential formulae for a one-dimensional problem, Algorithm of the method, Application of MRS to solve a beam bending problem, Beams on a resilient substrate, Background information, Beams of finite length, Initial parameter method, Application of MRS to solve the problem of a beam on an elastic substrate **b.Laboratory classes** Use of MRS for static calculations Determination of cross-sectional forces and displacements of a beam resting on an elastic substrate (with the Initial Parameter Method and the Finite Difference Method)	Pass with a grade	3	Lecture – preparation and presentation of a project on a given topic Laboratory classes - independent execution and (oral) defence of all individually assigned design exercises, ongoing consultations during classes
Programme and area subjects						
	Descriptive geometry	K_W01, K_W02, K_U15, K_K09	**a.Lecture** Basic elements in descriptive geometry. Methods and types of projection used in practice. Monge projections: belonging elements, common elements, parallel elements, perpendicular elements, rotations, layouts, transformations. Axonometric projections: types (isometric, dimetric, cavalier, military), practical applications Roof geometry: characteristic lines, example applications Topographic surfaces: characteristic lines, example use. **b.Workshop classes** Solving practical cases related to the lecture part: cross-sections of polyhedra and rotating surfaces with planes, puncture points of polyhedra and rotating surfaces with a straight line, interpenetration of polyhedra, real size of polygons, determination of a geometrical model in axonometric projections, determination of characteristic roof lines of a free-standing building, straight section of a road (embankments and excavations) Independent performance of control works from the scope of the conducted lectures and classes	Pass with a grade	2,5	Written test, performance of independent control assignments
	Fundamentals of architecture	K_W08, K_W14, K_U14, K_U20, K_K02	E-learning lectures: • Concepts and definitions of architecture • Architectural form and its development • Basic principles for the location of buildings and rooms • Smart building • Outline of the history of architecture from prehistoric to modern times	Pass	0,5	
	Technical drawing	K_W02, K_U15, K_K01	• Introduction to the course – discussion of the programme, materials and equipment needed to complete the course, applicable standards and literature, conditions for passing the course • Introduction to arrangement drawing – brief history of drawing, drawing techniques, drawing formats, drawing scale, drawing lines, information charts • types and sizes of drawing sheet formats, graphic forms of the drawing sheet, characteristics of technical lettering, types and thickness and purpose of drawing lines used in construction drawings, principles of drawing lines. • Drawing practice (drawing selected structures and geometric figures and producing type B technical lettering) – pencil work. • Rectangular projection and axonometric projection – principles of performance. • Application of the principles of rectangular projection and axonometric drawing. • Components of dimensioning and basic principles of dimensioning in construction drawings. • Making cross-sections. Dimensioning of components. overview of basic graphic symbols used in architectural and construction drawings (degrees of marking accuracy, principle of numbering the rooms on the building storey and the storey in the building cross-section, building orientation circle, cross-references, marking of ordinates, marking of elevations and slopes, slopes of excavations and embankments, marking of entrances to buildings, strip footing and spot footing, masonry and walls, coverings, principles of marking openings in vertical and horizontal space dividers, principles of drawing staircases, marking installation facilities - for heating and water supply and sewerage, staircase). • discussion on the principles of producing an inventory drawing (principle of producing a handwritten inventory sketch, the way of taking measurements and recording them, checking the correctness of taking measurements, producing an arrangement drawing on the basis of the inventory sketch). • overview of a task to be performed at home - carrying out an inventory measurement of the apartment, producing a hhandwritten inventory sketch with the dimensions, producing an arrangement drawing on the basis of the sketch (applying standard graphic designations and correct dimensioning of the drawing) • discussion of the general principles of dimensioning in arrangement drawings – the components of dimensioning – detailed information on dimensions, auxiliary dimensions, limit symbols, size numbers; dimension symbols; discussion of the basic principles of dimensioning in architectural and building drawings - in sequence: dimensions, dimensioning of window and door openings, dimensioning of ducts, dimensioning of circulation elements - ramps, ladders, staircases, level dimensioning.	Pass with a grade	1	E-learning test, handing in of project papers, conversation during the classes initiated by the lecturer

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Area: **Civil Engineering**

Study modules including the expected learning outcomes

			• consultation of completed inventory drawings, making corrections to the inventory drafts; preparation for the production of arrangement drawings with correctly applied graphic designations of materials, components and equipment and dimensioning of the drawing. • Construction drawing – on the example of a selected conceptual design: plans (arrangement drawing), cross-section, elevations, types of building materials (types of external walls) • graphical designations in architectural and construction drawings and degrees of accuracy: o building materials; o building elements; o steel and reinforced concrete structures; o wooden structures; o masonry structures; o prefabricated elements; o plumbing, gas and central heating equipment, ventilation; • principles of dimensioning and marking of elements in arrangement drawings, modular coordination in construction: o scales in architectural and construction drawings; o dimensions and auxiliary dimensions; o principles of dimensioning; o restriction symbols; o reference lines; o units of measurement; o conventional symbols; o slopes(%, °)			
	Building materials	K_W08, K_W17, K_U01, K_U05, K_U14, K_K01, K_K03, K_K07, K_09,	• Basic definitions – construction product, performance. Legal conditions for the use of construction products in Poland and the EU – declarations of performance, reference documents. Selected physical, physico-chemical and mechanical properties of building materials. • Ceramic building materials – production process, types, products and ranges and limitations of use. • Construction glass: drawing, rolling, float forming technologies; safety and IGU glass (laminated, toughened), glass limiting overheating (reflective, absorptive), glass limiting heat loss (thermofloat, thermisol) glass fibre and foamed glass products. • Structural timber and wood-based materials (solid and glued timber, plywood, OSB), insulation materials (fibreboard, cellulose fibre, cork), finishing materials (LDF, MDF and HDF boards, particleboard), roofing materials (shingles, drapery, thatch). • Asphalt binders and damp proofing products (basic concepts, bitumen modifications used, traditional, heat-sealable and self-adhesive membranes, roofing shingles, adhesives, asphalt-based compounds and emulsions). • Mineral binders. Basic definitions: air binder, hydraulic binder, paste, mortar. Division of air binders and their formation processes. Properties, standard requirements, designations used, scope of application. Paste and mortar products. Silicate products - production process, product range, properties, scope of application. Directions for mortar modifications. • Autoclaved cellular concrete products: production process, product range, properties, area of application. • Plastics: concepts, symbols, modification directions, basic properties. Plastic products: moulding and foaming methods. Thin-coat plasters. Adhesives. Paint, emulsion, varnish • Stone and stone products: characteristics of rocks used in construction. Stone cladding materials. Natural and crushed-stone aggregates - basic definitions, properties, scope of application. Stone wool: production technology, basic properties, products and their field of application • Hydraulic binders • Artificial aggregates • Concrete: basic definitions (ordinary concrete, high-value concrete, ready-mix concrete, designed concrete, concrete mix), concrete durability – structural and surface protection. Basic ingredients, admixtures and additives that modify the properties of the concrete mix and concrete. Steps in making concrete. Ordinary concrete products. New generation concrete. Designing the composition of concrete. • Introductory classes: giving pass conditions, dividing into groups, issuing topics for presentations. Determination of certain physical and mechanical properties of building materials using autoclaved cellular concrete as an example • Testing of ceramics • Testing of timber • Testing of binders • Testing of aggregates • Designing the composition of concrete using the paste method: Determination of requirements to ensure durability, selection of aggregate and cement • Testing the consistency of the concrete mixture • Non-destructive testing of concrete with a Schmidt hammer type N	Exam / Pass with a grade	7	Lecture-exam or test Laboratory classes - group reports on completed exercises, oral presentations or short tests on the completion of exercises, presentation of a selected group of materials
	Land surveying	K_W02, K_W03, K_U15, K_U21, K_K01	Introduction to the course "Land surveying" Basic terms used in land surveying, Basic tasks of land surveying, Types of surveying measurements with discussion, Control networks. Basic equipment used in land surveying Presentation and discussion of survey instruments, Examples of the use of survey instruments. Calculation of coordinates of plane points Concept of azimuth, method of calculation, Calculation of coordinates using the perpendicular offset method, Calculation of coordinates using the polar method, Levelling and tacheometry Geometric levelling Trigonometric levelling Elevation measurements of the topographic surface Free traverses Loop traverses GPS surveying Fundamentals of cartography Measurements of situational details, Measurement of horizontal and vertical angles, Levelling survey, Land levelling using the distributed point method.	Pass with a grade	2	Completion of exercises, preparation and defence of a report on the research carried out
	Expert classes	K_W14, K_W20, K_U05, K_U27, K_K01, K_K09	Expert lecture by a specialist, internship in a particular field should be devoted to issues specific to the work in the industry or company in question	Pass	4	Attendance, Pass as indicated by the instructor
	Computer Aided Design	K_W02, K_W11, K_U05, K_U15, K_K01	• Familiarisation with the AutoCAD environment, learning about the program's capabilities. • Philosophy behind working with AutoCAD • Appearance of the main application window • Customising the program to suit your needs • changing the appearance of the main application window, • customising toolbars, • creating the user's own toolbars, • Production of drawings • use of a benchmark, • templates, wizards, • Opening existing drawings in DWG format • Saving drawings in any format. • Drawing a line, a straight line, a multiline, a polyline • Drawing a circle, an arc, an ellipse. • Drawing a polygon, a rectangle, a spline • Modifications: erase, copy, move, rotate, mirror, offset, array, cut, lengthen, extend, stretch, break, handle discussion, scale, chamfer, round off • Precision drawing tools with required dimensions and distances • Creating a drawing - working on layers • Dimenioning • Creation of cut-outs, cross-sections. • advanced examples – exercises. Printouts • Designing a single-family house	Pass with a grade	2	Completion of laboratory classes, test report with conclusions

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Area: **Civil Engineering**

Study modules including the expected learning outcomes

	General construction	K_W05, K_U07, K_U08, K_U18, K_K01, K_K02, K_K09	• Introduction to the course "General construction"; basic concepts and assumptions, elements of buildings and civil structures, structural systems – terminology, characteristics and overview of civil engineering works, classification of basic structural elements • Walls in buildings; characteristics and division of walls, external and internal actions, construction of walls in conventional buildings, transfer of horizontal loads through walls of conventional buildings – spatial rigidity of buildings • Foundations in buildings; characteristics and division of foundations, examples of application • Staircase construction and design principles • Ceilings in buildings, wooden, reinforced concrete, beam-and-block floor – principles of detailed design and construction, criteria for selection of elements • Principles of selection and construction of flue pipes in buildings • Technical conditions to be met by buildings and their location - regulations implementing provisions to the Building Law. • Selection criteria and requirements for vertical and horizontal building space dividers • Structural loads – classification, determination principles, load combinations. • Roof slabs in conventional buildings – types of structures, classification, characteristics • Roof slope design, roofing, rainwater drainage • Roofs in conventional buildings - types of structures, formation of layouts, examples of application • Rules for determining and transmitting loads. • Design principles for beam-and-block floors – calculation example • Principles for the design and collection of roof slope loads – calculation example • Production of design documentation elements for a single-family building built in traditional technology: - specification, - collection of loads (ceiling, roof), - foundation plan, ground floor plan, attic plan, ceiling plan, - cross-section of the building (staircase), - selected building details, - roof truss plan, roof plan,	Exam / Pass with a grade	11,5	Lecture - written exam, Laboratory classes – test, independent execution and (oral) defence of all individually assigned design exercises, ongoing consultations during classes,
	Building physics	K_W10, K_U11, K_U18, K_K02, K_K07	• Basic concepts of the thermal physics of buildings. • Heat and mass transfer in building materials and buildings. • Legal considerations for building thermal protection. • Procedures for assessing the thermal performance of building components with thermally homogeneous and heterogeneous layers, space dividers in contact with the ground, windows and transparent space dividers. • The notion of a thermal bridge. Quantities characterising the thermal bridge. • Building heat balance. Heat transfer coefficient. • Risk of surface and interlayer condensation. Risk assessment for mould growth • The role of windows in the visual comfort and energy balance of a building. Building interior lighting. • Elements of building energy performance analysis. • Calculation of the heat transfer coefficient of space dividers with thermally uniform layers • Calculation of the heat transfer coefficient of space dividers with thermally inhomogeneous layers • Calculation of the heat transmission coefficient of window frames • Laboratory classes using a thermal imaging camera • Laboratory classes using acoustics testing equipment	Pass with a grade	4,5	Lecture – test Laboratory classes - project, test
	Strength of materials	K_W04, K_U01, K_U12, K_U13, K_U14, K_K01, K_K03, K_K09	• Introduction to the course "Strength of Materials" Basic concepts and assumptions of strength of materials Conditions for the balance of forces Bar supports External factors causing structural deformation. Loads Classification of essential structural elements Statically determinate and indeterminate structures Concept of internal and cross-sectional forces • Cross-sectional forces in plane bar structures Static calculation of straight beams Bar equilibrium differential equations Static frame calculations Static calculation of frames with ties Static calculation of circular and parabolic arcs • Geometrical characteristics of flat figures Static moments, inertia and deviations Inertia matrix and its transformation with rotation of the coordinate system and translation (Steiner's theorem) Principal, central axes and moments of inertia • Analysis of simple strength cases Normal force effect Uniaxial tension and compression Bending moment effect Straight bending Lateral force effect Technical shear b. Workshop classes • Determination of transverse forces in straight beams • Determination of transverse forces in continuous articulated beams • Determination of transverse forces in frames • Determination of normal stresses in flexural beams • Stress state in transversely bent beams • Determination of deflections and angles of rotation of cross-sections of bending beams • Analysis of complex strength cases Diagonal bending Transverse bending Eccentric tensioning • Strength analysis of axially compressed bars - Euler method • Determination of transverse forces in a multi-span articulated beam • Determination of transverse forces in a statically determinate frame • Determination of geometrical characteristics of a cross-section • Tensile strength test • Deep forming test • Impact strength • Torsion • Bending • Hardness test – Rockwell • Hardness test - Vickers • Basic static cases of selected bar structures • Checking the dimensions of the cross-section of a transversely bent beam	Exam / Pass with a grade	13,5	Lecture - written and oral exam, Workshop classes - test, independent execution and (oral) defence of all individually assigned project exercises, ongoing consultations during classes, Laboratory classes – completion of laboratory exercises, completion and defence of a report on tests carried out, report on tests carried out with conclusions
	Fundamentals of BIM	K_W11, K_U05, K_U15, K_K01	• Building Information Modeling • Revit Architecture fundamentals: user interface; working with Revit elements and families; starting a project • Design fundamentals: creating and modifying plans, levels, axes • Building modeling fundamentals: adding and modifying walls; creating sandwich walls and composite walls; using editing tools; working with Door objects; adding and modifying a Window object • Loading additional building components: adding and modifying Revit families • Viewing the building model: managing views; controlling visibility of objects; working on cross-sections and elevation views; creating and modifying 3D views • Using dimensioning tools and ties: creating dimensions; adding and removing ties • Building modelling tools: creating and modifying floors; creating and modifying ceilings; creating and modifying roofs; creating curtain walls; adding stairs and handrails • Creating drawing details: creating a reference view; using description and labeling tools; working with detailing tools • Design documentation: creating and modifying lists; creating rooms and room lists; creating keys • Design presentation tools: creating and printing worksheets; working with a drawing table; visualisation tools - rendering; use of graphic display tools - sun and shadow settings	Pass with a grade	2	Completion of laboratory classes, test report with conclusions
	Technical conditions in construction	K_W05, K_U18, K_K01	• Technical conditions to be met by buildings and their location - implementing regulations to the Building Law act	Pass with a grade	1	Standard or e-learning test

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Study modules including the expected learning outcomes

Elective Subject: Energy-efficient construction and energy certification*	K_W10, K_W11, K_U11, K_U15, K_K02, K_K07	• Basic concepts and legal issues in energy-efficient and green building. • Selected topics on building energy performance and energy classes of buildings with an environmental aspect. Share of renewable energy sources. CO_2 emissions of planned and existing buildings. • Design of the building envelope and its joints to an energy efficient standard. Modern thermal insulation materials. • Design of transparent dividers to an energy-efficient standard. Protection of rooms from overheating. • Shaping the architectural and functional layouts of buildings to an energy-efficient standard. Principles of landscaping on a building plot. Renewable and non-renewable energy sources: characteristics and examples of use, environmental impact. • Selected technical systems used in energy-efficient and green construction. • Legal aspects of energy auditing and certification in Poland • Calculation of the heat demand for heating, ventilation and domestic hot water • Methodology for producing an energy performance certificate • Overview of available computer programs to support the production of building performance and energy performance certificates • Selected computer program - user manual • Development of an individual design exercise for a design study of the building envelope and its joints to an energy-efficient standard, taking into account ecological and environmental aspects, together with the production of an energy performance certificate for the building	Pass with a grade	4	Lecture – written test Laboratory classes – correct completion and (oral) defence of an individual exercise
Elective Subject: Energy-efficient construction and energy audit*	K_W10, K_W11, K_U11, K_U15, K_K02, K_K07	• Basic concepts and legal issues in energy-efficient and green building. • Selected topics on building energy performance and energy classes of buildings with an environmental aspect. Share of renewable energy sources. CO_2 emissions of planned and existing buildings. • Design of the building envelope and its joints to an energy efficient standard. Modern thermal insulation materials. • Design of transparent dividers to an energy-efficient standard. Protection of rooms from overheating. • Shaping the architectural and functional layouts of buildings to an energy-efficient standard. Principles of landscaping on a building plot. Renewable and non-renewable energy sources: characteristics and examples of use, environmental impact. • Selected technical systems used in energy-efficient and green construction. • Legal aspects of energy auditing and certification in Poland • Calculation of the heat demand for heating, ventilation and domestic hot water • Methodology for conducting an energy audit • Overview of available computer programs to support the conduct of an energy audit • Selected computer program - user manual • Development of an individual design exercise for a design study of the building envelope and its joints to an energy-efficient standard, taking into account ecological and environmental aspects, together with an economic and technical analysis of a selected thermal upgrading project.	Pass with a grade	4	Lecture – written test Laboratory classes – correct completion and (oral) defence of an individual exercise
Structural mechanics	K_W04, K_U10, K_U13, K_K01, K_K09	• Introductory information: Geometrical system invariance, Basic principles and concepts of structural mechanics, Supports of civil structures, Breakdown of civil structures, Static calculations • Lines of action of support reactions and internal forces in plane bar systems that are statically determinate: Concept and essence of lines of action, Criteria of most unfavourable load setting, Indirect loading, Construction of lines of action by static method, Construction of lines of action by kinematic method • Energy fundamentals: Work of statically applied loads, Clapeyron's theorem, Specific elastic energy, Reciprocity principles for linear elastic bodies, Betti's theorem - Reciprocity of work, Maxwell's theorem - Reciprocity of displacements, Rayleigh's theorem - Reciprocity of reactions, Reciprocity of reactions and displacements theorem • Energy theorem for elastic bodies: Minimum potential energy principle, Minimum complementary energy principle, Castigliano's theorem • Virtual work equation Formulations of the virtual work equation Virtual work equation with virtual stress state Virtual work equation with virtual displacement state • Calculation of displacements of statically determinate systems Maxwell-Mohr method Calculation of displacement integrals Example of displacement calculation • Analysis of statically indeterminate bar systems General remarks Properties of statically indeterminate systems. Differences between statically determinate and statically indeterminate systems • Force method Essence of the method Steps in the force method Examples for the determination of transverse forces in statically indeterminate systems Frame Truss Beams (method of three moments) Displacement calculations for statically indeterminate systems • Spatial systems Horizontally curved and deflected beams Flat grids - statically determinate and statically indeterminate Spatial frames • Displacement method General characteristics of the method Transformation patterns Basic system Canonical equations Examples of application Beam Non-sliding frame Sliding frame • Analysis of statically and geometrically indeterminate bar systems – force and displacement methods – Choice of calculation method b. Workshop classes • Lines of action in statically determinate systems • Calculation of displacements in plane bar systems statically determinate by the virtual work method • Static calculation of plane bar systems statically indeterminate by the force method with consideration of the effects of temperature and settlement of supports: Frame Truss Beam (method of three moments) • Solution of statically determinate grids • Solution of statically indeterminate grids using the force method • Calculation of flat geometrically indeterminate bar systems using the displacement method (classical approach) Beam Frame • Determination of the line of action in statically determinate systems and of the envelope of the transverse forces • Calculation of internal forces in a statically indeterminate frame • Calculation of a statically indeterminate grid using the force method • Calculation of a plane frame using the displacement method (classical approach)	Exam / Pass with a grade	6,5	Lecture - written exam, E-learning – solving tasks Laboratory classes – test, independent execution and (oral) defence of all individually assigned design exercises, ongoing consultations during classes,
Metal structures	K_W04, K_W05, K_W06, K_W09, K_U07, K_U08, K_U18, K_K01	• Metallurgical materials and products • Principles of idealization of geometry, loads and behaviour of the structure under load - cross-section classes, critical stresses, plastic hinge, design resistances of the cross-section under various load conditions • Stability and dimensioning of elements: solid-walled rolled and composite beams, single and multi-branch columns. Structural floors • Welded and bolted connections • Fundamentals of corrosion and fire protection. • Detailed design and dimensioning of truss girders. • Dimensioning of nodes in truss girders. • Structural solutions for steel shelters and halls. • Hall stability, detailed design and calculation of bracing. • Technical regulations - standards for static calculations and determination of combinatorial loads for structures • Technical regulations – standards for the design of metal structures. • Dimensioning of welded and bolted joints. • Calculation of cross-section load bearing capacity under simple loading conditions (axial tension, axial compression and pure bending) • Classification of webs, shear strength of stocky webs • Axially compressed columns: single and built-up, flexural beams, structural and erection issues • Design of eccentrically compressed steel columns, calculation procedures and structural issues • Steel beam floor design, with plate multi-span downstands supported on walls and on a two-bay column. • Design of the main load-bearing system of a warehouse hall	Exam / Pass with a grade	12,5	Lecture - written and oral exam Workshop classes - test Laboratory classes - project
Concrete structures	K_W04, K_W05, K_W06, K_W09, K_U07, K_U08, K_U18, K_K01	• Principles for the idealisation of geometry, loads and behaviour of concrete structures under load. • Concrete as a structural material – strength, ad hoc stress-strain behaviour and rheology. • Reinforcing steel – design strength, stress-strain behaviour. • Interaction of concrete and reinforcement – adhesion, anchoring, stresses. • Ultimate limit state – computational models, effect of slenderness on column load bearing capacity. • Service limit states – computational models, durability of concrete structures. • Calculation and detailed design of reinforcement in basic building elements (slabs, beams, columns, strip footing and spot footing). • Forming, detailed designing and dimensioning reinforcement in slab structures - floors, retaining walls, foundation slabs. • Forming, designing and dimensioning reinforcement in frame and arc bar structures • Technical regulations – standards for static calculations and the determination of combinatorial loads for structures • Technical regulations – standards for the design of concrete structures. • Dimensioning of flexural elements - main and transverse reinforcement. • Load-bearing capacity assessment of an existing reinforced concrete element • Service limit states - checking deflection and cracking by simplified and exact methods. • Dimensioning of column and spot footing reinforcement. • Shaping of reinforcement in slab and bar elements to suit static quantities. • Design of an in-situ reinforced concrete slab-and-beam floor in a building with external load-bearing masonry walls – determination of the structural concept (shaping and subdivision into components) and selection of structural materials. • Design of an in-situ reinforced concrete slab-and-beam floor – determination of static quantities in the rib using tables and computer programs. • Design of an in-situ reinforced concrete slab and beam floor – dimensioning and detailed designing of reinforcement in the rib. • Design of an in-situ reinforced concrete slab-and-beam floor – preparation of technical documentation (drawings and specification). • Design of a reinforced concrete main frame for a single-storey building – determination of the structural concept (forming and subdivision into component parts). • Design of a reinforced concrete main frame for a single-storey building - collection of external loads on the building and selection of typical prefabricated elements. • Design of a reinforced concrete main frame for a single-storey building - determination of static quantities in an in-situ frame using a computer program • Design of a reinforced concrete main frame for a single-storey building - dimensioning and design of reinforcement in the transom, columns and spot footings. • Design of a reinforced concrete main frame for a single-storey building - preparation of technical documentation (drawings and specification).	Exam / Pass with a grade	12,5	Lecture - written and oral exam Workshop classes - test Laboratory classes - project

Syllabus part 2

Area: **Civil Engineering**

Study modules including the expected learning outcomes

Construction technique	K_W08, K_W09, K_U17, K_U18, K_U27, K_K07	• Basic definitions and terms related to the implementation of construction processes. • Specifics of construction production. Elements of construction production engineering. • Classification of construction works. • Fundamentals of mechanisation and automation of construction processes. • Systematics of construction machinery. Principles of construction machinery operation. Performance of construction machinery. • Construction transport technique. Horizontal transport. Vertical and diagonal transport. • Handling equipment and machinery. • Transport unit cycle time. Efficiency of means of transport. • Selection of the number of transport units. • Construction scaffolding and formwork. • Principles for the selection, calculation and acceptance of scaffolding and formwork components. • Health and safety rules on the issues outlined above. • Earthworks technique. • Civil structures and earthworks - categories and properties of ground suitable for foundation of civil structures. • Rules for determining the quantity of earthworks. Earth mass balance.• Excavating and embanking. Shoring. • Masonry works technique. Tools for masonry works. • Classification of construction scaffolding and its technical characteristics. • Concrete works technique. • Guidelines for the conduct of reinforced concrete works. Concrete compaction methods. • Construction of buildings using prefabricated technique. Installation work using construction cranes. Examples of prefabricated construction. • Finishing works. Systematics of finishing elements and related operations. • OSH rules for masonry, concrete, installation and finishing work. • Calculation of material quantities for the fabrication of structural elements of a building. • Methods of preparing building materials for transport. • Calculation of loading/unloading machinery capacity. • Calculation of the performance of means of transport • Calculation of levelling grid coordinates, excavation and embankment volumes using the squares and triangles method. • Calculation of the volume of wide-space excavation for a civil structure. • Calculating the performance of earthmoving machinery. • Design of the transport of building materials for the construction of a selected structural element for a given building. The design should include: description of the material and construction solutions of the component, characteristics of the materials adopted, means of transport, loading/unloading machinery, diagrams of the arrangement of materials on the means of transport, calculation of the quantity of means of transport required, calculation of the capacity of the means of transport and loading machinery, diagram of the transport cycle, occupational health and safety of the works carried out. • Design of earthworks for the given foundation slab of a building	Pass with a grade	4,5	Written pass, completion of classes and project as indicated by regulations, attendance and activity in classes
Cost estimates for construction works	K_W11, K_W15, K_U15, K_U16, K_K03	Introductory topics for the cost estimation of buildings and construction works • Literature and legal basis • Role and importance of construction cost estimators • Types of building cost estimates • BoQ and quantity survey • Computer-aided cost estimates Methods for calculating the cost estimate price • Simplified method • Detailed method Structure of the cost estimate price for civil structures and works • Types of prices • Sources of unit prices • Calculation of direct and indirect costs • Calculation of profit • Calculation of VAT • Components of the cost estimate price. Cost of design work under the "design – build" system. • Preparation of a bill of quantities for a selected single-family house • preparation of a detailed cost estimate for a single-family house	Pass with a grade	2	Final test, Verification of cost estimate. Practical testing of individual skills in the use of the program (including the contractors estimator and software instruments)
Construction of transport infrastructure	K_W05, K_W07, K_W09, K_W12, K_W14, K_U08, K_U17, K_U18, K_K09	• Introduction to the course "Construction of transport infrastructure" - Outline of the history of road, rail, tram and air transport. - Literature, course pass requirements. • Legal and technical norms for the construction of roads for motor vehicles, railroads and airports. • Enclosed structures and transport-related equipment. Engineering structures for transportation. • Road construction. - Earthworks and drainage (for all road types). - Classification of roads and their components. - Roads horizontally and vertically. - Transition curves and superelevation transition sections. - Road materials. Types of road pavement. - Road maintenance and repair works. - Interchanges and intersections. - Railroad crossings (crossings with tracks in one level). - Earthworks and drainage (for all road types). - Classification of roads and their components. - Roads horizontally and vertically. - Transition curves and superelevation transition sections. - Road materials. Types of road pavement. - Road maintenance and repair works. - Interchanges and intersections. - Railroad crossings (crossings with tracks in one level). b. Design exercises • Road design (road horizontally and vertically, transition curves, mechanistic design of the road pavement and its subgrade). • Design of a crossover at the railway station	Pass with a grade	2	E-learning lecture – written pass Laboratory classes - evaluation of the individual project with its defence by the student
Organisation of construction production	K_W08, K_W15, K_U16, K_U17, K_K03	Construction specifics. Principles of construction process organisation Organisation of the construction process. Division of construction processes. Work teams. Work fronts. Workstation organisation. Factors affecting productivity. Productivity and performance measures. Hazard identification. Construction production planning. Construction schedules. Network programming in the planning and organisation of construction works: two-point methods (CPM, PERT). Construction site set up design. Auxiliary manufactories and service bases in the construction industry. Site management. OSH in construction works. Design of the construction organisation of a selected building	Pass with a grade	2	Lecture – written pass Laboratory classes - design
Building law	K_W05, K_W16, K_U01, K_U18, K_K02,	1. Essence, characteristics and sources of building law - outline of the history of building law, - current literature on the subject, - analysis of the set of building regulations, - structure and scope of regulation of the Building Law Act and the Spatial Planning and Land Development Act, - definitions and concepts relating to the construction process, 2. Entities in the administrative construction process, their competences, rights and obligations - governmental authorities, scientific research institutions and industry associations supporting the correct course of the construction process, - independent technical functions in construction, - participants in the construction process and their roles, 3. Stages in the construction process - administrative decisions and required building documentation, - safe management of construction in the light of legislation and its completion. 4. Maintenance of erected buildings and their decommissioning.	Pass with a grade	2,5	Final test and active participation in discussions, regarding specific situations related to the engineer's work, freely moving through the legal acts discussed
Fire safety and OSH in construction	K_W13, K_W16, K_U18, K_K06	• Obligations of natural and legal persons with regard to fire protection, • Fire safety responsibilities of the owners of buildings and civil structures, • Impact of fire on the structure of the building, • Impact of fire on humans, • Selected elements of the combustion physical chemistry, • Principles for the approval of building plans with regard to meeting fire protection conditions, • Procedure for the use of alternative solutions in the fire protection of buildings, • Fire scenario – the role of the document in fire safety management, • Extinguishing media and hand-held firefighting equipment, • Fire Safety Manual • The essence of the "Safe building" philosophy in fire protection, • Responsibility for OSH at the construction site, • Rights and obligations of the worker, • Qualification and authorization of the employee to operate machinery and equipment on the construction site in light of current regulations • Work at height – methods and ways to protect the worker, • Degrees of protection of the worker against electric shock on the construction site, • Safe Work Manual – as a document defining the means and methods of carrying out particularly hazardous work at the construction site; methodology for drawing up the SWM, • Health and Safety Plan – as a document covering the whole process of protecting the worker on the construction site; methodology for drawing up and complying with the Health and Safety Plan on the construction site. • Determination of fire load density and permissible areas of fire zones in buildings, • Preparation of the SWM (Safe Work Manual) for a sample construction project	Pass with a grade	2	Written pass based on a test,

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Area: **Civil Engineering**

Study modules including the expected learning outcomes

Management of the investment process	K_W15, K_U17, K_K03	• Management of the construction project process in the light of current formal and legal changes. • Types of construction contracts. • Environmental protection in investment activities. • Procedures for obtaining administrative decisions. • Public procurement contracts. Types of tenders. • Tender documentation. • Organisational structures for the handling of construction. • Irregularities and disruptions in the management of the construction process. • Site control system. Building products in the light of regulations. • Unauthorised construction. • Construction site disasters and accidents. • Commencement of use of a civil structure. • Papers covering the scope of the lectures.	Pass with a grade	2	Lecture - written test; Workshop classes - paper on a topic issued by the lecturer;
Foundation	K_W07, K_W09, K_U07, K_U08, K_U18, K_K03, K_K09	• Shallow foundation – formation of the foundation and its dimensioning in relation to the type of subbase. • Deep foundation. Piles. Piling works technique. Wells. Deep excavation. • Retaining structures. Sheet piling. • Earth structure components. Embankment. Drainage. • Soil reinforcement methods. Soil reinforcement. Foundation reinforcement. • Calculation exercises for the determination of ground limit states • Design of shallow foundation – determination of ground limit states	Pass with a grade	2	Lecture - test Laboratory classes- independent execution and (oral) defence of all individually assigned project exercises, ongoing consultations conducted during classes,
Construction economics	K_W13, K_W15, K_W16, K_U16, K_U20, K_K02	• Basic microeconomic concepts. Basic tools for planning, organising and controlling the company. Types of construction companies. • Construction market features. • Elements of organisational, economic and financial analysis of a construction company. • Economic specifics of construction production. • Costs in construction. Analyses and cost accounting in construction. • The economics of materials management in a construction company. Materials management models. • Economics of operation of civil structures and buildings. Repair and maintenance costs. • Methods for assessing the effectiveness of construction ventures. Analysis of the financing of the execution of construction works. • Multi-part individual project - microeconomic analysis of a construction company • Presentation of a selected construction company – basic information • Analysis of the organisational structure • Market and product portfolio analysis – construction services • Economic and financial analysis of a company or venture (balance sheet analysis, profit and loss account, ratio analysis, investment account)	Pass with a grade	2	Lecture – oral pass
Elective Subject: Strength of Materials*	K_W04, K_U01, K_U12, K_U13, K_U14, K_K01, K_K03, K_K09	• Diagonal bending • Determination of stresses and test core in a simple eccentric (compressed) bar. • Strength analysis of axial-abrasive rods - Euler's test - 4h • Torsion of rods • Determination of the components of the complex state of stress and the determination of equivalent stresses according to the norms of stress procedures.	Pass with a grade	2,5	Laboratory classes – independent execution and (oral) defence of all individually assigned design exercises, ongoing consultations during classes,
Elective Subject: Structural Mechanics*	K_W04, K_U10, K_U13, K_K01, K_K09	• Influence lines for the reactions at supports and internal forces of plannar structures; • Spatial structures	Pass with a grade	2,5	Laboratory classes – independent execution and (oral) defence of all individually assigned design exercises, ongoing consultations during classes,
Elective Subject: Universal design I - Barriers and the accessibility of public spaces	K_W14, K_W16, K_U02, K_U19, K_K02	• Presentation of groups of people excluded and at risk of social and digital exclusion, • General awareness of accessibility and how to secure it, • Social responsibility of the designer • Savoir vivre in dealing with people with disabilities, • Discussion panels with people with special needs, including people with disabilities on the topic: diversity of needs and the impact of spatial (architectural) barriers on functioning in society. • Development of scenarios reflecting the functioning conditions of people with various disabilities and testing them on students	Pass with a grade	2	Preparation of the report, presentation
Elective Subject: Sociology of disabilities	K_W14, K_W16, K_U02, K_U19, K_K02	• Presentation of groups of people excluded and at risk of social and digital exclusion, • General awareness of accessibility and how to secure it, • Social responsibility of the designer • Savoir vivre in dealing with people with disabilities, • Discussion panels with people with special needs, including people with disabilities on the topic: diversity of needs and the impact of spatial (architectural) barriers on functioning in society. • Development of scenarios reflecting the functioning conditions of people with various disabilities and testing them on students	Pass with a grade	2	Preparation of the report, presentation
Elective Subject: Universal design II - Design of public spaces	K_W14, K_W16, K_U02, K_U19, K_K02	• Reminder of basic definitions – disability, accessibility, discrimination, universal design, • Universal design principles, • Legal conditions regarding the accessibility of public spaces and public buildings, • Elements of spatial information systems, so-called UIS - Urban Information Systems or SIS - Spatial Information Systems, • Surface Texture Marking Systems (FON), • New technological solutions to support orientation and movement in space, • Standards and norms for the accessibility of public spaces and public buildings, • Methods for assessing the accessibility of public transport systems, • Case studies and good practice in the application of solutions based on universal design principles • Analysis of accessibility (accessibility audit) of a selected public space or public building – practical implementation of an accessibility audit (space of a square, pedestrian route, street layout and development, park layout, leisure space, public building), • Formulation of modifying recommendations consistent with universal design principles in conducting accessibility audits, • Development of a concept for a new solution (computer visualisation).	Pass with a grade	2	Preparation of the report, presentation
Elective Subject: Universal design II - Pro-social design in education	K_W14, K_W16, K_U02, K_U19, K_K02	• Reminder of basic definitions – disability, accessibility, discrimination, universal design, • Universal design principles, • Legal conditions regarding the accessibility of public spaces and public buildings, • Elements of spatial information systems, so-called UIS - Urban Information Systems or SIS - Spatial Information Systems, • Surface Texture Marking Systems (FON), • New technological solutions to support orientation and movement in space, • Standards and norms for the accessibility of public spaces and public buildings, • Methods for assessing the accessibility of public transport systems, • Case studies and good practice in the application of solutions based on universal design principles • Analysis of accessibility (accessibility audit) of a selected public space or public building – practical implementation of an accessibility audit (space of a square, pedestrian route, street layout and development, park layout, leisure space, public building), • Formulation of modifying recommendations consistent with universal design principles in conducting accessibility audits, • Development of a concept for a new solution (computer visualisation).	Pass with a grade	2	Preparation of the report, presentation
Wooden structures	K_W04, K_W05, K_U07, K_U08, K_K09	• Basic concepts and definitions concerning wood as a structural material • Physical characteristics of wood • Wood (varieties, types) and wood-based materials used in construction • Mechanical properties of wood • Ultimate and service limit states in the design of wooden structures • Fasteners, connectors and joints • Roof shapes • Roof trusses • General principles and flow of static-strength calculations for wooden structural elements • Dimensioning of flexural elements • Dimensioning of roof truss elements • Design of a timber frame floor • Design of selected elements of a roof truss	Pass with a grade	2,5	Lecture – test Laboratory classes – test, evaluation of self-made designs supplemented by an evaluation of the student's oral expression while passing the designs
PDW: Operation of buildings*	K_W09, K_U22, K_K05	• Basic concepts and legal issues in the operation of buildings. • Procedures for obtaining an occupancy permit for a building and a change of use of a building. • Forms of property management. Rights and obligations of owners, managers, tenants, occupants and users of buildings. • Scope and keeping of the building log-book. • Technical inspections of buildings. • Wear and tear of buildings in technical, economic, environmental terms. Ways and methods of determining the technical wear and tear of a building. • Principles for the preparation of technical condition assessments for buildings. • Characteristics of selected refurbishment, upgrading works. • Construction disaster – definitions, examples, causes of occurrence. • Development of an assessment of the technical condition of a selected multi-family or commercial building and planning of its renovation and upgrading: elements of the assessment of the technical condition of the building, making an inventory of the analysed building (photographic documentation, site visit, interview with residents - users), plan for renovation, upgrading, etc., preliminary cost analysis of the planned activities. In the classes, the next elements of the design exercise are discussed and students present their progress on the design exercise.	Pass with a grade	2	Lecture – written test Laboratory classes – correct completion and (oral) defence of an individual design exercise

Syllabus part 2

Area: **Civil Engineering**

Study modules including the expected learning outcomes						
	Elective Subject: Diagnostics in construction*	K_W09, K_U22, K_K05	• Basic concepts and legal issues in building diagnostics. • Principles of correct operation of civil structures. Characteristics of technical inspections of civil structures. • Methods of diagnosing faults, errors, failures in civil structures; identification of reasons for their origin. • Construction disasters: definitions, examples, causes of occurrence. • Upgrading, renovation and demolition works in construction. Development of an individual design exercise in the diagnosis of a selected civil structure in terms of structural, biological and chemical corrosion; In the classes, the successive elements of the design exercise are discussed and the students present the progress of their design exercise.	Pass with a grade	2	Lecture – written test Laboratory classes – correct completion and (oral) defence of an individual design exercise
	Fundamentals of industrial construction and prefabrication	K_W05, K_W06, K_W07, K_W08, K_W12, K_U07, K_U27, K_K07	• Types and specifics of industrial construction - working conditions, static and dynamic impacts. • Industrial buildings - halls, single-storey and multi-storey buildings - material solutions (steel, concrete, wood) and technological solutions (prefabrication, in-situ concrete technology). • Industrial halls - elements of the main frame, bracing, actions from temperature and cranes. • Prefabrication plants - methods of production organisation. • Precast concrete plants - processes involved in the production of concrete mix, its transport and the forming of products, methods of accelerating the increase in the strength of concrete (heat treatment). • Tanks for liquids and bulk materials (silos) - material, structural and process solutions. • Chimneys, machine foundations, flyovers - material, structural and process solutions. • Technical documentation of a prefabricated product - design assumptions related to the intended use and working conditions • Technical documentation of a prefabricated product - design rules for static actions related to the operation of the structure • Technical documentation of a prefabricated product - process guidelines for the manufacture of an individual prefabricated product • Technical documentation of a prefabricated product - design principles with regard to the actions related to manufacture, transport and assembly • Example opportunities for use or construction of buildings related to the type of prefabricated product under design	Pass with a grade	2	Lecture – test Laboratory classes – test, evaluation of self-made designs supplemented by an evaluation of the student's oral expression while passing the designs
Module B **Construction area subjects**	Expert classes	K_W14, K_W20, K_U05, K_U27, K_K01, K_K09	• Expert lecture by a specialist, internship in a particular field should be devoted to issues specific to the work in the industry or company in question	Pass	1	Conversation during the class initiated by the lecturer
	Fundamentals of architectural and urban design	K_W14, K_U18, K_U19, K_U20, K_K02	• Shaping architectural space in terms of its relationship to humans, • Regional features and their importance in contemporary architectural design • Application of full integration of form – function – design • Dimensioning of spaces and fittings • Role of lighting – colours in the home interior • Introduction to basic issues of urban space formation and principles of urban composition • Familiarisation with the basic legal regulations in the design of single-family houses • Learning about the relationship between architecture and environment; learning about sustainable design principles. • Introduction to the shaping of architectural form through the composition of solids, planes and the textures and colours of the materials used. • Designing simple architectural forms, • Exercise of skills and manual proficiency in the techniques of presenting architectural solutions, • Introduction to basic issues of urban space formation and principles of urban composition	Pass with a grade	1,5	Independent completion and (oral) defence of an individually assigned project, ongoing consultations during classes
	Elective Subject: Finite element method*	K_W04, K_W11, K_U09, K_U12, K_U13, K_K08	• Introduction to SCILAB • Basic information about the finite element method (FEM) • Course of action when using FEM to solve structural mechanics problems • Basic FEM relationships and algorithm for solving a plane frame: stiffness and transformation matrices numerical analysis of a sample plane frame and selected code elements in the Scilab environment • Carrying out static calculations for a given structure (beam or plane frame) using FEM. As part of the exercise, students, among other things, write a computer programme in the Scilab environment, implementing a FEM algorithm	Pass with a grade	2	Evaluation of the completed project, supplemented by an evaluation of the student's oral speech when the project is scored
	Elective SUbject: Computer-based methods*	K_W04, K_W11, K_U09, K_U12, K_U13, K_K08	• Introduction to SCILAB • Basic information on computer methods in construction • Workflow for the application of FEM (Finite Element Method) for solving structural mechanics problems • Basic FEM relations and algorithm for solving a plane frame • Carrying out static calculations for a given structure (beam or plane frame) using FEM. As part of the exercise, students, among other things, write a computer programme in the Scilab environment, implementing a FEM algorithm	Pass with a grade	2	Evaluation of the completed project, supplemented by an evaluation of the student's oral speech when the project is scored
	Contemporary techniques and systems in construction	K_W08, K_U05, K_U14, K_K01, K_K07	• Water and moisture in the building envelope. Classification and characterisation of the effects of water and moisture in selected building dividers and materials. Chemical and biological corrosion of building materials. Methods and systems for drying damp building dividers and materials. Evaluation and characterisation of contemporary solutions. • Green roofs. Classification of green roofs in terms of plant selection. Selection of material layers for roofs with extensive and intensive vegetation. Characteristics of individual material systems. Evaluation of selected solutions. • Formwork in construction. Traditional, systemic and permanent solutions. Characteristics of individual variants with application examples. • External Composite Building Insulation System – basic assumptions, advantages and disadvantages. EIFS Barrier System – basic assumptions, advantages and disadvantages. Characteristics and comparison of selected building insulation systems. • (Thermal and moisture) Design study of a selected joint in a building with description of individual materials, taking into account contemporary solutions and systems (work carried out in a team of 1-2 persons). • Design study of a selected green roof slab with characteristics of individual material layers (work carried out in a team of 1-2 persons) • Design study of modern building solutions and systems - autonomous buildings, energy-efficient buildings, passive buildings, intelligent buildings, etc. (work carried out in a team of 1-2 persons)	Pass with a grade	2	Independent execution and (oral) defence of all individually assigned project exercises, ongoing consultations conducted during classes
Internship	Internship: "Employee competences"	K_W08, K_U27, K_K07	The detailed content of the internship is specified in the detailed Programme of the "Employee Competences" Internship. The principles of internship are regulated by: Regulations of Student Professional Internship approved by the Order of the Chancellor of the University of Economy	Pass	11	Report on the implementation of internship assessed by the internship supervisor at the workplace and by the internship supervisor at the Institute (Internship Form). Obtaining credit for the quizes as part of the course: "Employee competences" practice on the ONTE platform.
	Engineering Internship	K_W16, K_W18, K_U02, K_U05, K_U23, K_K10	The detailed content of the internship is specified in the detailed Programme of the Engineering Internship. The principles of internship are regulated by: Regulations of Student Professional Internship approved by the Order of the Chancellor of the University of Economy	Pass	21,5	Report on the implementation of internship assessed by the internship supervisor at the workplace and by the internship supervisor at the Institute (Internship Form).
Diploma process	Engineering Project	K_W05, K_W06, K_W17, K_W20, K_U01, K_U04, K_K02, K_K03	• Formulation of the engineering task and specification of its solution; • Implementation of the engineering project • Technical documentation of the engineering project • Presentation and report on the relevant stage of the engineering project	Pass with a grade	4	Evaluation of the progress of the thesis, implementation of the project
	Preparation for the diploma examination	K_W05, K_W06, K_W17, K_W20, K_U01, K_U04, K_K02, K_K03	Preparation of the engineering project adapted to the area of study in the broad sense of construction	Pass with a grade	2	Evaluation of preparation, presentation
	Diploma laboratory/Diploma workshop	K_W11, K_W19, K_U01, K_U04, K_K02, K_K03	Overview of diploma exam topics and preparation for public presentation of the engineering project	Pass with a grade	3	Evaluation of the progress of the engineering project