Załącznik nr 3 do uchwały Nr 11 Senatu UMK z dnia 28 marca 2023 r.

S t u d y p r o g r a m m e

Part A) of the study programme *

L e a r n i n g o u t c o m e s

Faculty offering the field of study:	**Faculty of Economic Sciences and Management**
Field of study:	**Digital Economy**
Level of study:	**First- cycle studies**
Level of the Polish Qualifications Framework:	**Level 6**
Degree profile:	**General academic**
Professional degree awarded to the graduate:	**licencjat**
Allocation of the field of study within academic or artistic discipline(s), to which learning outcomes for a given field of study refer:	**Discipline: Economics and Finance (63%), Management and Quality Studies (37%)**
	Major discipline: Economics and Finance

(1) Symbol	**(2) Upon completion the graduate achieves the learning outcomes specified below:**
	KNOWLEDGE (the graduate knows and understands)
K_W01	at an advanced level, mathematical and statistical methods and tools that allow to describe the structures and institutions related to digital economy, the processes taking place in them as well as relations between them;
K_W02	at an advanced level, general issues in the field of economics and finance on a micro-, macro- and global scales;
K_W03	at an advanced level, economic and financial structures and related institutions, as well as key effects resulting from activities of these institutions;
K_W04	at a basic level, ethical, economic, financial and legal standards and rules, including those relating to industrial property and copyright protection that specify the functioning of entities in digital economy;
K_W05	basic principles of creating and developing various forms of business capitalising on knowledge of economics and finance, especially related to the use of new solutions accompanying digital economy;
K_W06	issues related to the impact of digitisation on economy and its social and environmental effects;
K_W07	goals, essence, nature and interrelationships of management processes and implementation of changes in institutions as part of digitisation of economic processes;
K_W08	at an advanced level, concepts, methods and techniques for conducting research, including collecting and acquiring data from primary and secondary sources, data from social networks, selected tools of advanced data analysis and data visualisation that are necessary to conduct activities in digital economy;
K_W09	at an advanced level, the possibility of using the state-of-the-art information technologies as the basis for the development, provision and analysis of services or products carried out by business entities;

K_W10	at an advanced level, ICT tools and techniques used by business organisations in the digital economy era.
SKILLS (the graduate is capable of)	
K_U01	use knowledge and relevant sources to assess, interpret and solve complex or atypical problems related to the development of economy, in particular with its digitisation;
K_U02	conduct research on the processes taking place in digital economy and to evaluate their results, using advanced IT tools;
K_U03	use normative systems (legal, economic, social) in economic and financial decisions, taking into account changes generated by the digitisation of economy;
K_U04	apply research methods and techniques relevant to problems under conditions of economy's digitisation (including advanced IT tools and technologies as well as mathematical and statistical methods);
K_U05	understand and analyse the causes and course of phenomena in economy; is able to theoretically insightful assessment of these phenomena in selected areas, including those related to the impact of digitisation;
K_U06	forecast economic processes and phenomena occurring in the era of digital economy with the use of methods and tools relevant to economic sciences as well as tools for finding patterns, models and correlations in large data sets;
K_U07	prepare typical written assignments and presentations, using state-of-the-art communication techniques, and to apply economic and financial terminology and terms related to the digitisation of economy;
K_U08	use a foreign language at the B2 level as specified in the requirements set by the Common European Framework of Reference for Languages, taking into account the terminology characteristic of digital economy;
K_U09	be communicative, use specialist terminology and take part in debates as well as effectively communicate the developments and achievements of economics and finance in the digital age in an understandable way; adjust the level and form of presentation to the needs and capabilities of the audience;
K_U10	formulate the directions of their development and to be focused on the continuous acquisition of new knowledge, skills and experience, in particular to keep up with the processes of digitization of the economy and independently plan their own self-improvement and life-long improvement of professional competences;
K_U11	work in a team (also an interdisciplinary one), establish and maintain long-term and effective cooperation; to strive to achieve the goals of the team through appropriate planning and organisation of their own work and the work of other persons; to motivate colleagues to increase their efforts to achieve their goals;
K_U12	take decisions as to starting business activity, taking into account relevant selection of sources, their critical assessment of information, selection and use of relevant tools, including advanced ICT techniques and tools.
SOCIAL COMPETENCES (the graduate is willing to)	
K_K01	adhere to the rules of conduct specific to professions in the digital economy, including ethical professional standards, and requires the above from other persons;
K_K02	think and act as an entrepreneur in a changing economic reality;

K_K03	critically assess the knowledge and information received, taking into account changes generated by the economy's digitisation, and to consult experts in the event of difficulties in solving problem on their own;
K_K04	fulfil social commitments, co-organise activities for the benefit of the social environment and initiate activities for the public interest.

Part B) of the study programme

Description of the process resulting in the achievement of learning outcomes

Faculty offering the field of study:	**Faculty of Economic Sciences and Management**
Field of study:	**Digital Economy**
Level of study:	**first cycle studies**
Level of the Polish Qualifications Framework:	**Level 6**
Degree profile:	**General academic**
Allocation of the field of study within academic or artistic discipline(s), to which learning outcomes for a given field of study refer:	Discipline: Economics and Finance (63%), discipline: Management and Quality Studies (37%) Major discipline: Economics and Finance
Mode of study:	full-time programme
Number of semesters:	six
Number of ECTS required for the award of qualifications corresponding to the level:	180
Total number of teaching hours:	1785 hours including university lectures
Professional degree awarded to the graduate:	Licencjat
The relationship between the study programme and NCU mission and strategy:	UMK mission refers to educational activities corresponding to the current and future society needs as well as the development of cooperation and knowledge transfer with external partners. Currently, one of the key challenges for enterprises is the implementation of digital transformation processes, the creation and introduction to the market innovations based on digital technologies, as well as the use of data for effective business operations. Knowledge in this area is to be ensured by the proposed studies. New studies will also enable establishing cooperation with other research centres and economic entities that will be directly involved in conducting classes and will enable to exchange thoughts and experiences between the scientific and economic communities.

Courses/course modules along with expected learning outcomes				
Module	**Course**	**Expected learning outcomes**	**Forms and methods of teaching ensuring the achievement of learning outcomes**	**Methods of verifying and assessing expected learning outcomes achieved by the student**
General education	Intellectual Property Protection	W1: Student has basic knowledge of intellectual property and is acquainted with methods of its protection, especially under industrial property and copyright laws – K_W04	Expository teaching methods: - informative (conventional) lecture	Assessment methods: - written test
	Contemporary Learning Techniques	U1: is able to complete and improve knowledge in various subjects using the mindmapping technique and selected memorization techniques – K_U1	Lecture: computer's presentations supported by elements of workshop exercises like mindmapping, memorization techniques and educational kinesiology.	Assessment methods: Written assessment in classroom

	Business English	U1: understands oral and written communications in English on topics related to the digital economy. K_U07 U2: is able to communicate in English using a variety of channels and techniques on general and digital economy-related topics. K_U08 U3: is able to read and listen with understanding, translate, analyze and interpret various types of texts, and verbal communications in English and find in them the information needed to function in the digital economy. K_U07 U4: has the ability to prepare typical written work and oral presentations on issues relevant to the digital economy. K_U08	Cognitive-communicative method with the use of various media and varied forms of student work.	The final semester grade consists of: - continuous assessment (current preparation for classes, completion of homework and activity in classes) - mid-semester written control tests covering the examination of issues mastered by the student - written assignments (company structure, CV& letter of application) - oral assignments (job interview, oral presentation on a selected topic) The English course ends with a written exam testing listening skills, reading comprehension and knowledge of grammatical structures, vocabulary and collocations
	Physical Training	depends on the chosen course	depends on the chosen course	depends on the chosen course
	Huminities lectures	depends on the chosen lecture	depends on the chosen lecture	depends on the chosen lecture
	University lectures	depends on the chosen lecture	depends on the chosen lecture	depends on the chosen lecture
	Occupational Safety, Health and Ergonomics	Moodle course		

	Information Technology I	W1: The graduate knows the tools available in the MS Office package - K_W08, K_W10 W2: The graduate knows the basic services of the Internet - K_W09, K_W10 U1: The graduate is able to choose the appropriate MS Office tools to solve problems in business - K_U02, K_U04, K_U06 U2: The graduate is able to use Internet services and use tools for individual and remote work - K_U01, K_U04, K_U06 K1: The graduate is able to analyze and solve problems using IT tools and act in an entrepreneurial way in the changing economic realities - K_K02, K_K04	show, practical, discussion, classic problem-solving	Written test - practical test at the computer to verify the skills of independent problem solving. - activity in class, solving problems alone and in groups.
	Information Technology II	W1: The graduate has advanced knowledge of MS Office tools - K_W01, K_W08, K_W10 W2: The graduate knows the basic protocols of the Internet - K_W09, K_W10 U1: The graduate is able to use advanced MS Office tools to analyze the processes occurring in the digital economy - K_U02, K_U04 U2: The graduate is able to use terminology specific to the digital economy - K_U07 K1: The graduate is ready to analyze problems, implement IT solutions and act in changing economic realities - K_K02	show, practical, discussion, classic problem-solving	- practical test at the computer to verify the skills of independent problem solving. - activity in class, solving problems alone and in groups.

Unit Basic Subject	Applied mathematics	W1: The graduate knows and understands mathematical methods that allow for quantitative analysis of economic phenomena – K_W01. U1: The graduate is able to apply acquired theoretical knowledge to formulate and solve selected mathematical problems, and also related economic problems - K_U02, K_U04. U2: The graduate is able to apply computer software to solve specific mathematical problems - K_U02, K_U04. K1: The graduate is prepared and willing to formulate the problem, and to solve it using the proper solution method - K_K03.	- informative (conventional) lecture - practical	Lecture: written examination Classes: - test - individual work/activity
	Statistics in economic studies	W1: chooses appropriate statistical methods depending on the type of statistical data and studied phenomenon – K_W01 W2: uses statistical notions correctly – K_W01 U1: calculates descriptive measures – K_U01 U2: applies correlation measures – K_U01 U3: estimates parameters of regression model and calculates measures of goodness of fit, performs statistical inference and evaluation of the regression model quality – K_U01 U4: applies statistical tests of different parameters in the population – K_U01 U5: calculates dynamic indecies – K_U01 U6: interprets the results from both statistical and economic point of view – K_U01	Lecture: computer's presentations (including mindmapping), Exercise: in classroom and in computer lab. Materials containing contents from lectures and exercises, and also a sample of questions and tests for assessment and examination are uploaded in Moodle.	Written examintation Written assessment in classroom:

	Econometrics and Forecasting	The graduate knows: W1: the principles and methods of building econometric models (K_W01) W2: specialized software/computer packages (e.g. Gretl) for modelling economic processes (K_W01) W3: the basic forecasting methods and forecasting schemes based on time series models and descriptive/causal models (K_W01) The graduate is able to: U1: construct and evaluate the quality of an econometric model (K_U04) U2: analyze the causes and course of economic phenomena using econometric models (K_U05) U3: forecast economic processes and phenomena using econometric models and evaluate the quality of the obtained forecasts (K_U04)	Classes conducted in the form of: - informative lecture with the use of computer presentations (conventional lecture, problem-based lecture), - tutorials - classes in the computer laboratory with the use of MsExcel and Gretl programs;	Credit for the course on the basis of: - written exam (theoretical and practical) - test in the computer laboratory

	Introduction to economics	Lecture: W1: knows and understands at an advanced level issues in the area of microeconomics and macroeconomics (K_W02) W2: knows and understands at an advanced level the basic economic structures and relationships between them (K_W03) U1: can use relevant sources and theoretical knowledge in the field of microeconomics and macroeconomics to analyze, interpret and evaluate economic phenomena and problems (K_U01; K_U05) U2: is able to analyze economic decisions in terms of compliance with legal, economic and social standards (K_U03) K1: is ready to assess his knowledge gained as a result of the course in the field of basic economics and to consult experts in the event of difficulties with solving the problem on his own (K_K03) Classes: W1: knows and understands at an advanced level issues in the area of microeconomics and macroeconomics (K_W02) W2: knows and understands at an advanced level the basic economic structures and relationships between them (K_W03) U1: can use relevant sources and theoretical knowledge in the field of microeconomics and macroeconomics to analyze, interpret and evaluate economic phenomena and problems (K_U01; K_U05) U2: is able to analyze economic decisions in terms of compliance with legal, economic and social standards (K_U03) K1: is ready to assess his knowledge gained as a	Lecture: - informative lecture (conventional), - problem-based lecture. Exercises: - discussion, - solving tasks, - case study.	Lecture: Written examination Classes: Colloquium Presentations Activity - the student's activity during the lectures and classes may increase the final grade.

		result of the course in the field of basic economics and to consult experts in the event of difficulties with solving the problem on his own (K_K03)		

	Business Law	W1: The graduate has a basic knowledge of legal rules connected with starting, conducting and ending of business activity (K_W04) W2: The graduate is familiar with the forms of business activity (K_W05) U1: the graduate is able interpret the basic norms of business law in the professional relations (K_U03) U2: The graduate is capable to solve the common problems in business activity using the rules of business law (K_U12) K1: The graduate understands the significance of acting according to legal norms in business and private relations (K_K01) K2: The graduate understands the significance of updating the knowledge of legal norms in business law, including the changes of law connected with digitalization (K_K03)	Expository teaching methods: - informative lecture - case studies presentation.	written examination case studies/problem solving during exam
	Management	W1: The graduate knows and understands the classic and modern methods of analyzing the organization and its environment, relations between the functional areas of the enterprise and the types of organizational structures and factors influencing their changes. In addition, they demonstrate the knowledge of instruments and tools that allow for solving problems in the area of management of organizations as part of the ongoing digitization – K_W07 U1: The graduate has the following skills: proper diagnostic assessment of the organization, analytical and interpretation related to the basic phenomena and processes of digitization taking place in modern enterprises with the use of basic concepts and theoretical approaches – K_U05 K1: The graduate is ready to think and act in an entrepreneurial way, as well as to recognize the role	1. Conventional lecture 2. Problems lecture	Written exam Activity

		of knowledge in the discipline of management and quality science in solving management problems accompanying organizations in the changing economic realities – K_K02		

	Marketing and Marketing Research	W1: The student knows the role of marketing and marketing research in carrying out activities within the digital economy K_W08 W2: The student knows and understands the differences between primary and secondary sources of information K_W08 W3: The student knows the basic methods of collecting data from primary and secondary sources K_W08 W4: The student knows the random and non-random sampling techniques K_W08 W5: The student knows the rules of designing an interview questionnaire and the survey questionnaire K_W08 W6: The student knows the activities undertaken at the stage of research design, data collection, data reduction, data analysis, as well as the presentation and evaluation of the results of the marketing research K_W08 U1: The student is capable of planning activities and marketing instruments necessary to solve problems related to the development of the digital economy K_U01 U2: The student is capable of identifying the main types of information sources used in marketing research K_U04 U3: The student is capable of transforming decision problems into research problems K_U04 U4: The student is capable of determining the size of the random and non-random sample for the marketing research K_U04 U5: The student is capable of designing questionnaire questions and properly scaling the answers K_U04 K1: The student is ready to resolve ethical	Lecture: conventional lecture and problem-based lecture Tutorials: discussion, case study	Assessment methods: - written examination (lecture) and final test (tutorials) - different types of exercises or tests during tutorials or at home (individual or teamwork)

		dilemmas related to the implementation of marketing research K_K01		

Unit Main Course Subject	Basics of banking and financial markets	W1: The graduate knows and understands at an advanced level the economic and financial structures and their institutions as well as the key effects of the activities of these institutions in the sphere of banking and financial markets - K_W03 W2: The graduate knows and understands at an advanced level the economic and financial norms and rules that define the functioning of entities in the banking sector and financial markets - K_W04 U1: The graduate is able to use normative systems (legal, economic, social) in the area of economic and financial decisions in the sphere of banking and financial markets, taking into account the changes generated by the digitization of the economy - K_U03	Lecture: organizational lecture, information lecture, problem lecture, presentation with description, discussion, multimedia presentation.	Written exam.

	Corporate finance	Lecture: W1: Graduate knows and understands to an advanced degree the principles of corporate financial management, with particular emphasis on the methods of shaping the structure of assets and capitals for financing the activities of the enterprise - K_W03 W2: Graduate knows and understands to an advanced degree the economic and financial norms and rules that determine the functioning of enterprises in the digital economy - K_04 U1: Graduate is able to use economic and financial principles in the area of economic and financial decisions, made in the enterprise - K_U03 Classes: W1: Graduate knows and understands to an advanced degree the principles of corporate financial management, with particular emphasis on the methods of shaping the structure of assets and capitals for financing the activities of the enterprise - K_W03 W2: Graduate knows and understands to an advanced degree the economic and financial norms and rules that determine the functioning of enterprises in the digital economy - K_04 U1: Graduate is able to use economic and financial principles in the area of economic and financial decisions, made in the enterprise - K_U03	Lecture: organizational lecture, informative lecture, problem lecture, demonstration with description, discussion, multimedia presentation. Classes: active participation in discussion, solving tasks, case study.	Written exam. Classes: final evaluation taking into account the grades of two colloquia.

	Start in business and a business plan	Lecture: W1: The graduate knows the basic principles of creating and developing various forms of entrepreneurship using knowledge in the field of economics and finance, especially related to the use of new solutions accompanying the digitization of the economy - K_W05 U1: A graduate is able to use economic and financial principles in the area of economic and financial decisions made in the enterprise – K_U03 K1: The graduate is ready to think and act in an entrepreneurial way in the changing economic realities – K_K02 Classes: W1: The graduate knows the basic principles of creating and developing various forms of entrepreneurship using knowledge in the field of economics and finance, especially related to the use of new solutions accompanying the digitization of the economy - K_W05 U1: A graduate is able to use economic and financial principles in the area of economic and financial decisions made in the enterprise – K_U03 K1: The graduate is ready to think and act in an entrepreneurial way in the changing economic realities – K_K02	Lecture: organizational lecture, information lecture, problem lecture, presentation with description, discussion, multimedia presentation. Exercises: active participation in discussions and solving a case study.	Written exam Exercises: the final grade is the average of the grades obtained from the completed case studies.
	Digital technologies in economy and finance	W1: knows the possibilities of using the latest information technologies as the basis for the creation, offering and analysis of services or products by business entities and can assess the consequences of their use - K_W09 W2: has knowledge of the characteristics of information and communication (ICT) instruments, tools and techniques used by business organizations in the digital economy - K_W10 U1: is able to use knowledge and select appropriate sources for the assessment of the possibility of	Lecture: organizational lecture, information lecture, problem lecture, presentation with description, discussion, multimedia presentation.	Written exam.

		using digital technologies to solve problems related to the development of organizations within the digital economy - K_U01		
	Cybersecurity	W01 – Has knowledge of basic concepts in the field of internal security as a sub-area of social sciences and knowledge of cyber security – K_W06 U01 - Can observe and interpret social phenomena in cyberspace. He notices their interrelationships. Understands the causes and course of phenomena related to cyberspace security. Is able to use theoretical knowledge about threats related to cyberspace - K_U01 K01 - Is ready to specify the basic priorities aimed at counteracting threats in cyberspace to the existing social structures. Using modern techniques, he communicates skillfully and without problems with the environment, providing knowledge about the existing threats and the possibilities of protection against them - K_K04	description, discussion, problem-based lecture, classic problem-solving	Written test

	Business data visualisation	W1: knows the methods and techniques of business data visualization - K_W08. W2: knows and can use Business Intelligence systems for data analysis and visualization - K_W10. U1: can evaluate and draw conclusions based on the prepared analyzes - K_U02. U2: has the ability to find patterns and dependencies contained in data - K_U12 K1: is ready to present the results of the analyzes carried out reliably and in accordance with the facts - K_K01	exercises, talk, group work, using the Business Intelligence Qlik Sense tool, solving tasks	Final pass including: • preparation of a data model based on several source files saved in various formats • preparation of an application containing prepared reports and visualizations • presentation of the project
	Management Information Systems	W1: The graduate identifies the classes of information systems supporting the management of the organizations (K_W09) W2: The graduate lists the functionalities of IT systems in the organization (K_W10). U1: The graduate effectively manages the known functional modules of IT systems in the organization (K_U11) U2: The graduate distinguishes and understands the connections of business processes in a typical organization and identifies their mapping on the IT platform (K_U01, K_U11) K1: The graduate is ready to think and act in an entrepreneurial way in the changing economic realities on the basis of the assessment of related risks and to take up challenges allowing to use the acquired knowledge in the field of using information-based management systems (K_K02)	- informative lecture (conventional) - exercise	Lecture: Written examination Classes: - Test - In-class activity

	E-government	W1: the concept of e-government and its development phase – K_W02 W2: basic concepts, ICT solutions used in administration– K_W09, K_W10 W3: benefits of using e-government for natural and legal persons and legal bases of e-government and legal mechanisms for the protection of personal data – K_W04, K_WO6 W4: place in the policy of the European Union, the level of implementation in Poland and other Member States and the prospects for the development of e-government, K_W03 U1: learns to navigate the Internet space and uses the acquired knowledge to solve problems, K_UO1 U2: learns to communicate competently, consciously and convincingly, K_U08, K_UO9, U3: learns to understand and analyze system solutions, forecasts their application in the future– K_U10 U4: learns to use legal regulations– K_U03 K1: is ready to acquire the knowledge, information and data needed in solving practical problems in professional life with particular emphasis on problems in political science and administration – K_K04;	Lecture provided: - in the form of a traditional lecture using PowerPoint	Written exam

	Digital economy business models	Lecture: W1: theoretical and practical assumptions of business model design - K_W10 W2: roles of the business model in the digital economy K_W07 W3: basic principles of building an innovative business model K_W07 W4: alternative approaches to designing business models K_W07 W5: determinants of success or failure of individual selected business models K_W07 W6: selected case studies of modern business models of enterprises and organizations based on K_W06 values Classes: U1: defining the basic elements of building business models K_U01 U2: analysis of factors influencing the choice of the business model K_U05 U3: the ability to design business models and the principles of building an innovative business model. K_U01 U4: distinguishing between positive and negative determinants of selected business models K_U05 K1: analytical thinking and creative search for solutions to organizational problems arising in the preparation of a business model K_K02 K2: use of various sources of information K_K03 K3: formulating arguments in defense of the developed business model and adopting critical verification by the group - the ability to adapt the model to the expectations K_K02 K4: takes into account the social and environmental conditions of business activity K_K01	Classes conducted: - in the form of a traditional lecture with the use of presentations - a lecture with active participation of students (interaction) - in the form of exercises, conducted at a seminar lecture and a case study: preparation of a model concept for a hypothetical project, work of students in teams, presentation and joint analysis of the presented model, required preparation for classes (reading literature), reading case studies, being active, carrying out tasks	Exam written test based on the content discussed in the lecture and exercises Exercises: - activity, carrying out tasks - team work - case studies - prolonged observation by the tutor - independent work (final project prepared in teams and its presentation)

	Project Management	Lecture: W1: The student describes the possibilities of using information and communication technologies in project management - K_W10 U1: The student takes an active part in planning and organizing team projects in order to complete the task set for him on time and in accordance with the established quality requirements - K_U11 K1: The student solves the task set for him in a creative way, critically analyzing and completely modeling the problem under consideration (using appropriate tools and techniques, taking into account the knowledge and opinions of experts), collecting the necessary data for this purpose, specifying key issues/factors/criteria that should be taken into account and identifying relationships between them - K_K03 K2: The student uses quantitative methods and appropriate software in the project management process, interprets the obtained results and uses them to make the best decisions for the benefit of stakeholders - K_K04 Classes: W1: The student describes the possibilities of using information and communication technologies in project management - K_W10 U1: The student takes an active part in planning and organizing team projects in order to complete the task set for him on time and in accordance with the established quality requirements - K_U11 K1: The student solves the task set for him in a creative way, critically analyzing and completely modeling the problem under consideration (using appropriate tools and techniques, taking into account the knowledge and opinions of experts),	lecture, description, talk, discussion; presentations in the Microsoft Office PowerPoint; using the Excel spreadsheet, GanttProject and OpenProject/Microsoft Project programs; solving tasks; project	Lecture: • final written exam including: - open and closed questions Tutorials: • assignment 1: implementation of the project – teamwork • assignment 2: teamwork on solving a decision-making problem related to project management • continuous assessment (preparation for classes, homework and activity in the classroom)

		collecting the necessary data for this purpose, specifying key issues/factors/criteria that should be taken into account and identifying relationships between them - K_K03 K2: The student uses quantitative methods and appropriate software in the project management process, interprets the obtained results and uses them to make the best decisions for the benefit of stakeholders - K_K04		

	Introduction to Logistics and e-logistics tools	Lecture: W1: student has knowledge of goals, essence, nature and interrelationships of logistics, e-logistics and the implementation of changes in the institution during the digitisation of logistics processes; - K_W07 W2: student has knowledge of goals, essence, nature and interrelationships of e-logistics tools and the implementation and use of these in the institution; - K_W07 K1: student critically assess the knowledge and information received, taking into account changes generated by the economy's digitisation, and to take on the challenges of using the knowledge and skills acquired to shape and improve the institution's logistical support system, information flow, selection and use of e-logistics tools; - K_K03 Classes: U1: student use knowledge and relevant sources to assess, interpret and solve complex or atypical problems related to the logistical support system of the institution and the tools used in the field of e-logistics – K_U01 U2: student work in a team (also an interdisciplinary one), establish and maintain long-term and effective cooperation with other persons; to strive to achieve the goals of the team through appropriate planning and organisation of their own work and the work of other persons; to motivate colleagues to increase their efforts to achieve their goals; - K_U11 K1: student critically assess the knowledge and information received, taking into account changes generated by the economy's digitisation, and to take on the challenges of using the knowledge and skills acquired to shape and improve the	lectures with multimedia presentations, teamwork, case studies	Lecture: written exam Tutorial: test Case study Tasks carried out during classes in the form of case study and projects carried out independently by students Activity

		institution's logistical support system, information flow, selection and use of e-logistics tools; - K_K03		

	Digital transformation of the economy and ESG	Lecture: W1: knows and understands the impact of digitization on the economy and its social and environmental effects, taking into account public policies, including the policies of the European Union - K_W06; Learning outcomes - skills U1: knows the principles of initiating economic activity and making its critical assessment in terms of its economic, social and environmental effects - K_U12 K1: is ready to fulfill social obligations and co-organize activities for the social and natural environment - K_K04 Classes: W1: knows and understands the impact of digitization on the economy and its social and environmental effects, taking into account public policies, including the policies of the European Union - K_W06; Learning outcomes - skills U1: knows the principles of initiating economic activity and making its critical assessment in terms of its economic, social and environmental effects - K_U12 K1: is ready to fulfill social obligations and co-organize activities for the social and natural environment - K_K04	Information lecture, problem lecture, demonstration with description, discussion, multimedia presentation	Written exam

	Ethics in business and technology	Assumed learning outcomes in the “knowledge” category, which a student of the course acquires through realization of the subject: W1: knows and understands to an advanced degree the norms and ethical rules, including those concerning respect and protection of industrial property and copyright, defining the standard of socially responsible, environmentally sustainable and transparent functioning of digital economy entities – K_W04 W2: knows and explains the impact of digitisation on the economy and its social and environmental effects – K_W06 Description of assumed learning outcomes in the “skills” category, which a student of the course acquires through realization of the subject: U1: is able to create and use an ethical normative system when making responsible economic, financial, environmental and personal decisions, taking into account the changes generated by the digitalization of the economy – K_U03 U2: strives for personal self-development in the aspect of key ethical competences and is oriented in this respect to the continuous acquisition of new knowledge, skills and experience in order to react adequately to innovations in the area of digitisation of the economy and to plan his/her own self-improvement and improvement of professional competences throughout life – K_U10 U3: is able to work competently, creatively and synergistically in a team, guided by the ethical and business directive of harmonious cooperation avoiding segregationist, violent, harassing and discriminating behaviours; strives for the achievement of the team objectives through	conventional lecture with elements of a conversation class, problem-based lecture, case studies, multimedia presentation, comparative study method	Assessment methods and criteria: The lecture ends with a pass mark. To pass it entitles to: – a final written single-choice test on the content of the lectures, supplemented by recommended readings; – credit deadline: last class in the cycle

		appropriate planning and organisation of his/her own work and that of others; motivates his/her co-workers to increase their efforts to achieve the assumed objectives of the company – K_U11 Assumed learning outcomes in the category of "social competences", which the student acquires through the realization of the subject: K1: abides by the rules of conduct adopted in professions related to the digital economy, including ethical professional norms, and requires others to do so, aiming to enhance the organisational culture of the enterprise in which he/she is employed, and to strengthen the social prestige and ethos of the professional group he/she represents – K_K01 K2: fulfils the social obligations to which the digital economy is subject, and initiates, co-organises or supports the activities of his/her own professional environment for the benefit of the social environment – K_K04 K3: initiates, coordinates or supports activities taking into account the public interest, inter alia by evading or signalling to competent authorities for ethical reasons identified violations, abuses or crimes against the public interest – K_K04		

	Communication in business I	W1: knows to an advanced degree the instruments and techniques of communication used in enterprises in the age of the digital economy (K_W10)U1: is able to be communicative, use specialized terminology and participate in debate and effectively convey information in the business world, and is able to adapt the way of communication to the needs of the audience (K_U09) U2: is able to prepare typical written works in English and speeches, using modern techniques of communication (K_U07) U3: is able to work in teams, taking care of cooperation between its members, especially through effective communication (K_U11) K1: is ready to critically evaluate the knowledge he possesses and the content he receives especially on the level of communication in enterprises (K_K03)	Multimedia lecture, conversational lecture, workshop, group work, simulation, case study	Lecture - Written exam, Exercise - activity during classes, final work
Specialisation Data Science in Business	Introduction to scripting languages - Python and R	W1: The graduate has knowledge about programming, knows: principles of structured programming, programming constructs, data types - K_W08 U1: The graduate is able to write correct programming code - K_U04 U2: The graduate is able to process data, in particular to transform them for mathematical and statistical analysis - K_U04 K1: The graduate is able to analyze problems and implement optimal programming solutions taking into account the changes generated by the economy - K_K02, K_K03 K2: The graduates is ready to seek expert opinions and expand own competences - K_K03	- show - practical - discussion - classic problem-solving	- activity in class and solving simple programming tasks - practical test at the computer verifying the skills of independent problem solving)

	Managing data and data systems in the organization	W1: The graduate has knowledge of relational database models - K_W08, K_W_09, K_W10 W2: The graduate has knowledge of tools that support work in relational databases - K_W08, K_W09, K_W10 U1: The graduate is able to design a database according to certain rules - K_U04 U2: The graduate is able to search information in the database - K_U04 U3: The graduate is able to work with data in the database - K_U04 U4: The graduates can programing their own functions, procedures, triggers – K_U04 K1: The graduate is able to analyze problems and implement an IT solution while respecting professional ethical standards - K_K01 K2: The graduate is ready to seek expert opinions, expand own competences and fulfill social obligations – K_K03, K_K04	- show - practical - discussion - classic problem-solving	Lecture - graded credit: - Project and implementation of own database application Exercises - test - solving given problems
	Software for Business Analysis	W1: can acquire, process and analyze data collected by entities conducting business activity - K_W08. W2: knows and uses software designed to prepare business analyzes - K_W10. U1: can make economic decisions based on previously prepared analyzes - K_U11. U2: has the ability to find patterns and relationships in large economic data sets - K_U12. K1: is ready to act and take up challenges in the economic environment, based on the acquired knowledge - K_K02.	exercises, talk, group work, use of a business analysis tool, eg KNIME, problem solving	Final pass including: • loading and transforming the data needed to perform the analysis • preparation of a complete data analysis of an entity conducting business activity • presentation of the project

	Big Data processing	W1: The graduate knows and understands to an advanced degree the methods and computer tools that allow to describe the structures of Big Data sets, the processes occurring in them, as well as the relationships between them - K_W01 W2: The graduate knows and understands to an advanced degree the concepts, methods and techniques for collecting and retrieving Big Data sets from primary and secondary sources, data from social networks, selected tools for visualization of Big data sets, necessary for conducting activities in the digital economy - K_W08 W3: The graduate knows and understands to an advanced degree the instruments and tools for processing Big Data sets that are used by organizations and institutions in the era of digital economy - K_W10 U1: The graduate is able to use knowledge and relevant sources to diagnose, interpret and solve complex problems of collection and processing of Big data sets that serve the digitization of business and economy - K_U01 U2: The graduate is able to apply methods and techniques of research of Big data sets that are appropriate to the problems in the conditions of digitization of business and economy - K_U04 K1: The graduate is prepared and willing to respect ethical standards and principles of conduct in the collection and processing of Big data sets and requires others to do so - K_K01	conventional lecture, exercise, laboratory	Lecture – written examination, test Exercises: independent solution of a problem related to Big data processing (computer laboratory)

	Introduction to Data Science and Machine Learning	W1: The graduate knows and understands at an advanced level the concepts, methods and techniques of research, including the collection and acquisition of data from primary and secondary sources, data from social networks, selected tools of advanced data analysis and data visualization necessary to conduct activities within the digital economy (K_W08) W2: The graduate knows at an advanced level the methods and mathematical and statistical tools that are the foundation of data science (K_W10). U1: The graduate is able to use research methods and techniques appropriate to the problems in the digitalisation of the economy (K_U04) U2: A graduate is able to forecast economic processes and phenomena occurring in the era of digital economy with the use of methods and tools appropriate for economic sciences, as well as tools for finding patterns and correlations in large data sets (K_U12) K1: The graduate is ready to think and act in an entrepreneurial way in the changing economic realities on the basis of the assessment of related risks and to take up challenges allowing to use the acquired knowledge in the field of data science - (K_K02)	- informative lecture (conventional) - exercise	Lecture: Written examination Classes: - Test - In-class activity

	Association analysis	W1: The graduate knows and understands at an advanced level, unsupervised learning methods for association studies - K_W01, K_W08, K_W09, K_W10. W2: The graduate knows and understands at an advanced level, methods and techniques for collecting and preparing data for association analysis - K_W08. U1: The graduate is able to conduct research on association analysis using proper methods for data exploration – K_U02, K_U04, K_U11, K_U12 U2: The graduate is able to apply proper computer software to explore and analyze association rules - K_U04, K_U11 K1: The graduate is prepared and willing to formulate the problem in the field of association analysis, and to solve it using the proper solution method, adhering ethical professional standards - K_K01, K_K03.	- informative (conventional) lecture - practical	Lecture: written examination Classes: - project - individual or group work

	Taxonomic methods in economic applications	W1: knows the basic ordering and grouping methods for economic objects (K_W01). W2: knows possibilities and limitations of the use of the methods in comparative analyzes, especially in terms of dynamics (K_W01). Student U1: interprets data and can use various data sources (K_U01). U2: orders and groups economic objects from a cross-sectional perspective (K_U01, K_U04). U3: interprets the results of analyzes, assesses the nature and importance of the observed regularities (K_U01). Student K1: understands the usefulness and importance of analyzes using methods of ordering and grouping of economic objects; understands the need to expand knowledge and improve skills in the field of analysis of complex economic phenomena, necessary for entrepreneurial activity (K_K02). K2: is ethical in acquiring and using knowledge (K_K01).	(1) demonstration teaching methods (display); (2) expository teaching methods (informative/conventional lecture); (3) exploratory teaching methods (practical, project work, presentation of a paper/report), i.e.: - lecture with elements of multimedia show – Power Point shows, computer presentations of analyzes with the use of Excel and R-Cran. - practicals in the computer laboratory; conducting analyzes with the use of Excel and R-Cran.	Lecture is credited on the basis of the result of the test. Exercise classes end preparation of the final course work.

	Predictive analytics	W1: The graduate knows and understands at an advanced level, supervised learning methods for predictive analytics - K_W01, K_W08. W2: The graduate knows and understands at an advanced level, methods and techniques for collecting and preparing data for predictive analytics - K_W08. U1: The graduate is able to conduct research using proper methods for predictive analytics - K_U02, K_U04, K_U11, K_U12 U2: The graduate is able to apply proper computer software to conduct studies in the field of predictive analytics - K_U04, K_U11 K1: The graduate is prepared and willing to formulate the problem in the field of predictive analytics, and to solve it using the proper solution method, adhering ethical professional standards - K_K01, K_K03.	- informative (conventional) lecture - practical	Lecture: written examination Classes: - project - individual or group work

	Time series analysis	W1: at an advanced level, mathematical and statistical methods and tools of time series analysis that allow to describe the structures and institutions related to digital economy, the processes taking place in them as well as relations between them (K_W01) W2: at an advanced level, concepts, methods and techniques for conducting research of time series analysis, including collecting and acquiring data from primary and secondary sources, data from social networks, selected tools of advanced data analysis and data visualisation of time series analysis that are necessary to conduct activities in digital economy (K_W08) U1: understand and analyse the causes and course of economic processes in economy; is able to theoretically insightful assessment of these phenomena in selected areas, including those related to the impact of digitization (K_U05) U2: anticipate economic processes and phenomena occurring in the era of digital economy with the use of methods and tools relevant to time series analysis as well as tools for finding patterns, models and correlations in large data sets (K_U06) K1: The graduate is prepared and willing to formulate the problem in the field of time series analysis, and to solve it using the proper solution method, adhering ethical professional standards (K_K01, K_K03).	Teaching methods: - multimedia presentation - case study - computer laboratory	Written exam (theoretical and practical) Exercises - final test, activity

	Non-Classical Forecasting Methods	The graduate knows and understands W1: mathematical and statistical methods and tools necessary to determine forecasts of economic phenomena – K_W01 W2: specialised software (e.g. R, Gretl) for modelling and forecasting economic processes – K_W08 The graduate is able to U1: can obtain and use a variety of data sources related to the development of the economy – K_U01 U2: forecast economic processes and phenomena – K_U06 The graduate is prepared and willing to K1: perform assigned tasks conscientiously and accurately. Proceed ethically – K_K01 K2: to work independently and effectively with large amounts of data. To carry out analysis and draw conclusions using the principles of logic – K_K02	Expository teaching methods: - informative lecture Working with GRETL, R-CRAN and Excel software. Teaching using real macroeconomic and enterprise data.	Lectures - written examination Exercises - test and solving chosen problems, project and observation
	Text analytics of data from social media	W1: The graduate at advanced level knows the techniques of text data analysis of social media, their representation and visualization (K_W08) U1: The graduate evaluate results of text analysis in the context of the processes taking place in digital economy (K_U02) ; U2: The graduate is able to develop a text data analysis system in Python (K_U04) K1: The graduate understands the interdisycplinary nature of big social data analysis (K_K03)	Expository teaching methods 1) Description Exploratory teaching methods 1) practical 2) project work	Written examination

	Network analysis and recommender systems	W1: The graduate knows and understands at an advanced level, methods and techniques for collecting and preparing data, for network studies and building recommender systems - K_W08. W2: The graduate knows and understands at an advanced level, possibilities of efficient application of recommender systems for the development, provision and analysis of services or products carried out by business entities - K_W08, K_W09. W3: The graduate knows and understands at an advanced level, methodology of graph and network theory - K_W10. U1: The graduate is able to apply methodology of graph and network theory to analyze communities in real networks - K_U04, K_U12. U2: The graduate is able to build and analyze recommender systems - K_U04, K_U12. K1: The graduate is prepared and willing to formulate the problem in the field of predictive analytics, and to solve it using the proper solution method, adhering ethical professional standards - K_K01, K_K03.	- informative (conventional) lecture - practical - case study	Lecture: written examination Classes: - project - individual or group work
	RPA and chatbots	W1: knows at an advanced level the possibility of using the latest UiPath platforms as the basis for creating services or products in the field of digitisation, automation and robotisation of the processes of business entities K_W09. U1: can practically use knowledge and appropriate tools to solve problems of business entities in the environment of digitisation, automation and robotisation of internal processes K_U01. K1: is ready to think creatively and act in order to solve problems of business entities in the environment of digitisation, automation and robotisation of internal processes K_K02.	Problem solving, project, discussion, group work, observation, case study.	Project

	Data Driven Decisions	W1: The graduate knows quantitative methods for optimizing business decision-making processes and improving the quality of management decisions based on digital data. (K_W10) U1: The graduate is able to independently classify and thus qualify decision-making situations and associate new decision-making situations with the learned model structures. (K_U01) U2: The graduate is able to use the known tools to determine decisions based on digital data. (K_U01, K_U04) K1: The graduate is ready to think and act in an entrepreneurial way in the changing economic realities on the basis of the assessment of related risks and to take up challenges allowing to use the acquired knowledge in the field of decision-making methodology based on digital data. (K_K02)	- exercise	Classes: - Project - In-class activity

	Management and implementation of Data Science projects	W1: The student lists the basic IT structures and tools used in the implementation of data science projects (K_W01). W2: The student formulates decision problems related to data science project management and chooses a decision-making method appropriate from the point of view of the decision problem under consideration (K_W07). W3: The student is able to list the key stages of a data science project, knows the structure of the division of work within the project, and also carries out a risk analysis for the project (K_W07). W4: The student determines the purpose and issues of project management and recreates the model of project implementation over time (K_W08). W5: The student has a structured knowledge of the selected data science methods (K_W10). U1: The student uses quantitative methods in the project management process, interprets the obtained results and uses them to make the best decisions (K_U01). U2: Can reformulate the processing problem in such a way that its solution uses the methods available among those presented (K_U12). K1: Can precisely formulate questions to deepen his own understanding of a given topic or to find missing elements of understanding (K_K02). K2: Can independently search for information in literature, also in foreign languages (K_K03). K3: Works systematically and has the ability to positively approach difficulties standing in the way of achieving the assumed goal; keeps the deadlines (K_K04).	- Teaching methods: laboratory, exercises, description, talk, multimedia presentations in the Microsoft Office PowerPoint computer program, using an Excel spreadsheet, solving tasks, projects. - Didactic methods exposing: demonstration. - Teaching methods giving: description, talk, informative lecture (conventional), problem lecture. - Search didactic methods: classical problem, laboratory, exercise and project method.	- Assessment criteria for the laboratory are based on 5-6 mini-projects, partly performed in laboratories and partly independently. The correctness and completeness of the answers and solutions will be assessed, including the correctness of the calculations made and the interpretation of the obtained results.

	Multi-criteria mangerial decision aiding	W1: The student indicates the possibilities of using information and communication technologies in making managerial decisions - K_W10 U1: The student takes an active part in the planning, organization and effective implementation of team projects in order to complete the task set for him on time and in accordance with the established quality requirements - K_U11 U2: The student uses multi-criteria methods and appropriate software in the process of making managerial decisions, including decisions regarding the initiation of economic activity - K_U12 K1: The student carries out the tasks set for him in a creative and entrepreneurial way - K_K02 K2: The student critically analyzes and completely models the problem under consideration (using appropriate tools and techniques, taking into account the knowledge and opinions of experts), collecting the necessary data for this purpose, specifying key issues/factors/criteria that should be taken into account and identifying relationships between them - K_K03	description, talk, discussion; presentations in the Microsoft Office PowerPoint; using the Excel spreadsheet and the M-MACBETH program; solving tasks; project	• Teamwork on solving managerial decision-making problems • Continuous assessment (preparation for classes, homework and activity in the classroom)
	Statistical methods of survey data	W1: knows statistical tools that allow to analyze the structure of the collected data - K_W01. W2: knows the methods and techniques of collecting data in opinion polls - K_W08. W3: knows selected tools of advanced data analysis and data visualization - K_W08 U1: interprets data and information collected from questionnaires - K_U01. U2: can use knowledge in practice to build a questionnaire and design a survey - K_U01 U3: can use appropriate data collection methods - K_U04	Lecture with elements of a multimedia presentation - Power Point. Classes in the computer laboratory. Conducting analysis using: Excel, SPSS. Results presentation. Discussions.	Lecture - written exam Practice - evaluation of the student's activity during classes in the laboratory, presentations of self-performed tasks, final control project

		U4: can find correlations between the variables included in the questionnaire - K_U06 K1. Is ready to obey ethical and legal standards related to the protection of personal data in questionnaire surveys - K_K01		

	Methods and models for spatial data analyses	Student W1: knows methods and tools in the field of spatial statistics and spatial and spatio-temporal econometrics, useful for the study of economic phenomena and processes (K_W01). W2: knows rules for conducting research with the use of spatial data (K_W01). W3: knows methods and techniques of obtaining data necessary to conduct research on economic phenomena (K_W01). Student U1: can use methods and tools of spatial statistics as well as spatial and spatio-temporal econometrics for studying economic phenomena in terms of digitization of the economy (K_U01, K_U04). U2: identifies the structures of regional data (spatial and spatio-temporal) and interprets data; is able using various data sources (K_U01). U3: can diagnose and forecast spatial phenomena related to the digitization of the economy (K_U01). U4: uses appropriate statistical and econometric analysis software (K_U04). Student K1: understands the usefulness and importance of analyzes using tools and methods in the field of modern spatial statistics and econometrics; understands the need to expand knowledge and improve skills in the field of analysis of complex economic phenomena, necessary for entrepreneurial activity (K_K02). K2: is ethical in acquiring and using knowledge (K_K01).	(1) demonstration teaching methods (display); (2) expository teaching methods (informative/conventional lecture); (3) exploratory teaching methods (practical, project work, presentation of a paper/report), i.e.: - lecture with elements of multimedia show – Power Point shows, computer presentations of analyzes with the use of Excel and R-Cran. - practicals in the computer laboratory; conducting analyzes with the use of Excel and R-Cran.	Lecture is credited on the basis of the result of the test. Exercise classes end preparation of the final course work .

	Financial Econometrics	W1: He knows modern methods and tools for analyzing and forecasting financial time series - K_W01 U1: Evaluates the relationship of financial processes and markets based on financial econometric models - K_U05, K_U12 K1. Works independently and effectively with large amounts of data, sees dependencies and correctly draws conclusions using the rules of logic; can precisely formulate questions to deepen his own understanding of a given topic or to find missing elements of reasoning - K_K02	informative lecture (conventional), problem lecture, exercise	Written examination Test Project In-class activity
	Diploma seminar	W1: has subject matter knowledge of issues related to the digitisation of economic and financial processes - K_W02; K_W06; K_W07 W2: has advanced knowledge of methods and tools, including data acquisition techniques, used to describe structures and institutions within the digital economy - K_W01; K_W08 U1: has the ability to carry out logically coherent economic analyses of selected problems in the digital economy - K_U01; K_U02; K_U04; K_U05; K_U06 U2: has the ability to prepare typical written work in Polish in accordance with the requirements for a good thesis - K_U07 K1: enhances his/her ability to participate competently in discussions on relevant issues in the digitisation of the economy - K_K02; K_K03	The seminar method is of primary importance. Within the seminar group, all problems related to the implementation of the next steps in the development of the individual thesis are discussed.	Successive semesters of the seminar are based on: - semester I - selection of the topic, development of the structure of the thesis and writing of the first chapter of the thesis, - semester II - development and submission of a complete thesis.

Specialisation Digital innovations in business &FinTech	Digital transformation of enterprises and transformation plan	Lecture:W1: the essence of the digital transformation of economy and business K_W05 W2: principles of digital maturity analysis and preparation of a digital transformation plan K_W05 W3: the effects of digitization processes for economic activity K_W06 W4: methods of conducting transformation, design thinking K_W07 W5: the essence of team management, communication strategies influencing the effectiveness of implementing the transformation plan and building positive attitudes towards introducing changes K_W07 U1: Diagnose the level of digital maturity of the organization and propose directions for changes K_U01 U2: Prepare a digital transformation plan in a selected area of operation of the organization K_U06 U3: Distinguish between models of creating a digital transformation plan K_U01 U4: Present the results and conclusions of the analysis publicly and work effectively in a team K_U09 K1: The student has social competences in the field of analytical thinking and creative search for solutions to complex organizational problems. K_K02 K2: Has soft skills, is able to assess the risks related to the assessment of the role of individual people implementing digital transformations and is able to assign tasks to members of the project implementation team. K_K02 K3: Can use the acquired knowledge to solve practical problems related to the economic	Classes conducted: - in the form of a traditional lecture using PowerPoint presentations - in the form of exercises developing the ability to use theoretical knowledge to prepare a digital transformation plan, based on discussions, projects, and case studies. Work takes place in teams, required preparation for classes (reading literature), reading case studies, activity, carrying out tasks.	Lectures - Test Exercises - Papers / essay

		development of enterprises and their impact on society. K_K04 K4: Managing a project team responsible for transforming the organization. K_K04 Classes: W1: the essence of the digital transformation of economy and business K_W05 W2: principles of digital maturity analysis and preparation of a digital transformation plan K_W05 W3: the effects of digitization processes for economic activity K_W06 W4: methods of conducting transformation, design thinking K_W07 W5: the essence of team management, communication strategies influencing the effectiveness of implementing the transformation plan and building positive attitudes towards introducing changes K_W07 U1: Diagnose the level of digital maturity of the organization and propose directions for changes K_U01 U2: Prepare a digital transformation plan in a selected area of operation of the organization K_U06 U3: Distinguish between models of creating a digital transformation plan K_U01 U4: Present the results and conclusions of the analysis publicly and work effectively in a team K_U09 K1: The student has social competences in the field of analytical thinking and creative search for solutions to complex organizational problems. K_K02 K2: Has soft skills, is able to assess the risks related to the assessment of the role of individual people implementing digital transformations and is able to		

		assign tasks to members of the project implementation team. K_K02 K3: Can use the acquired knowledge to solve practical problems related to the economic development of enterprises and their impact on society. K_K04 K4: Managing a project team responsible for transforming the organization. K_K04		

	Entrepreneurship and development of startups	Lecture: W1: The student knows and understands the basic principles and management tools in the process of creation and development of forms of individual entrepreneurship, including those related to the application of solutions accompanying the digitisation of economy - K_W05 Classes: U1: The student is able to make decisions concerning the initiation of economic activity, taking into account a proper selection of information sources, their critical evaluation, analysis and synthesis, selection and application of proper tools - K_U12 K1: The student is ready to think and act in an entrepreneurial manner in a changing economic reality, which enables him/her to solve problems occurring at the stage of construction and implementation of the concept of activity of forms of individual entrepreneurship - K_K02	Lecture: problem-oriented lecture conducted by a traditional method with the use of a multimedia presentation, in a way that provides an opportunity to discuss the discussed issues with students. Classes: conversation with students, in which tasks are solved, case studies are analysed, practical decision-making problems are discussed and solved in the scope of issues related to the undertaken subject. Didactic methods giving: informative lecture (conventional), conversational lecture, problem-based lecture. Exploratory didactic methods: exercising, classic problem method, case study	Lecture: - written credit in the form of a test with choice answers Classes: - completion of a credit work: preparation of a concept for a new business. The basis for the final evaluation of the classes is the evaluation of the credit work, which may be increased by above-average student activity within the framework of the conservatory and above-average commitment to cooperation within the framework of teamwork.

	Innovative projects and fundraising for R&D	Lecture: W1: Students know the concept of innovation based on digital technologies. K_W07 W2: They will acquire knowledge about the methods of assessing the level of innovation in accordance with the Innovation Radar Platform and the assessment of technological readiness in accordance with the TRL (Technology Readiness Level) methodology. K_W07 W3: Students will gain knowledge about the methods of designing research and development activities based on the principles of preparing a research agenda and a project approach in accordance with the PMI methodology along with the principles of determining the WBS (work breakdown structure) and setting milestones according to the SMART principle. K_W07 W4: Students know the rules of preparing an application for EU funding and are able to discuss the main components of such an application. K_W04, K_W07 Classes: W1: Students know the concept of innovation based on digital technologies. K_W07 W2: They will acquire knowledge about the methods of assessing the level of innovation in accordance with the Innovation Radar Platform and the assessment of technological readiness in accordance with the TRL (Technology Readiness Level) methodology. K_W07 W3: Students will gain knowledge about the methods of designing research and development activities based on the principles of preparing a research agenda and a project approach in accordance with the PMI methodology along with the principles of determining the WBS (work	Classes conducted: - in the form of a traditional lecture using PowerPoint presentations - based on case studies and discussions, - in the form of exercises developing the ability to use theoretical knowledge to prepare the research agenda and the structure of the division of labour. Work takes place in teams, required preparation for classes (reading literature), reading case studies, activity, carrying out tasks.	Exam

		breakdown structure) and setting milestones according to the SMART principle. K_W07 W4: Students know the rules of preparing an application for EU funding and are able to discuss the main components of such an application. K_W04, K_W07 U1: Students will have the ability to assess the level of project innovation and to assess the technological readiness of the project. K_U01 U2: Students are able to prepare a research agenda, plan a work breakdown structure and set milestones according to the SMART principle. K_U01 K1: They know the rules of cooperation in order to achieve the project goals. K_K02 K2: Can point out the weaknesses of the project and the social consequences of the project. K_K04 K3: Can indicate what are the individual roles in the project, including the division of tasks in international teams K_K04		

	Legal regulations in the digital economy	Lecture: W1: knows the legal standards at an advanced level, including those relating to the protection of industrial property and copyright, which define the functioning of digital economy entities - K_W04; W2: has knowledge of the impact of legal regulations on digitization on the functioning of the economy, society and the effects on the natural environment - K_W06; K1: is ready to comply with the rules of operation in accordance with the legal regulations on the protection of personal data and other legal regulations for the digital economy - K_K01; Classes: U1: can use legal systems in the area of economic and financial decisions, taking into account the changes generated by the digitization of the economy - K_U03;	lecture: informative (conventional), conversational, problematic, multimedia presentation prepared by the lecturer, introductory talk, discussion, film screening, presentation of payment authentication devices, payment cards and mobile applications; exercises: a paper prepared by the student, case studies, discussion	Written examination; Study, Discussion and case study
	Customer Relationship Management & User Experience	Lecture: W1: The student knows the methods and tools of user experience research - K_W05; K_W08; W2: The student knows the principles, conditions, basic concepts and systems of customer relationship management (CRM) - K_W05; K_W08; Classes: U1: The student can use the following techniques in the field of user experience: map of empathy, map of impressions, design thinking, sorting cards, prototyping, testing, creating a mock-up - K_U01; K_U02; K_U12 U2: The student is able to independently analyze and assess the company's situation and propose solutions in the field of building relationships with customers - K_U02; K_U12 U3: The student can make a test report - K_U02; K_U07; K_U12 K1: The student understands the need to create	Expository teaching methods: - informative (conventional) lecture, - description, - discussion. Exploratory teaching methods: - laboratory, - project work, - case study, Online teaching methods: - cooperation-based methods, - methods referring to authentic or fictitious situations,	Written examination Group project, Group project presentation Activity Performing tasks

		accessible and useful products and services - K_K03 K3: The student is able to plan management of customer relations - K_K03 K4: Can present a report - K_K01;	- content-presentation-oriented methods.	

	Digital banking, payment systems, and FinTech	Lecture: W1: The student classifies and explains the functioning of different types of electronic banking, types of payment services, and settlement systems, taking into account their financial, organizational, and technical aspects - K_W02 W2: The student recognizes and explains the mechanisms of digital financial services, including payment and settlement systems, as well as the roles and strategies of banks, other financial institutions, and non-bank FinTech players - K_W03. Classes: U1: The student is able to select appropriate statistical data and information from the market offerings for specific types of digital financial services, including e-banking, and present them clearly to the group for decision-making in a case study - K_U03 K1: The student is able to independently analyze the summary of offers for digital financial services and payment services, critically evaluating the received information - K_K03	Lecture: informative (conventional), conversational, problem-based, - A multimedia presentation prepared by the lecturer, introductory talk, discussion, film screening, demonstration of payment authentication devices, payment cards, and mobile applications; - Exercises: paper prepared by the student, case studies, SWOT analysis, discussion.	Written exam Presentations Discussion and case studies

	E-commerce	Lecture: W1: The student knows the role of e-commerce in the digital economy K_W06 W2: The student knows the differences between the various forms of e-commerce K_W04 W3: The student lists and describes the determinants of e-commerce K_W06 W4: The student describes the basic business models of e-commerce K_W04 U1: The student is capable of identifying problems related to the use of various forms of e-commerce in business organizations K_U01 U2: The student is capable of recommending solutions to specific problems arising in business organizations that use e-commerce K_U01 K1: The student is ready to think and act in an entrepreneurial way in business organizations that use e-commerce K_K02	Lecture: conventional lecture and problem-based lecture Tutorials: discussion, case study	#NAZWA?

	Industry 4.0	Lecture: W1: historical determinants of changes in the impact of technology on the economy and society K_W02 W2: selected problems of modern digital technologies and their impact on the economy and society, K_W02 W3: the effects of changes that modern digital technologies introduce into the principles of enterprise functioning and social behaviour. K_W02 U1: distinguish between positive and negative factors influencing the effectiveness of implementing Industry 4.0 solutions K_U01 U2: indicating the importance of the selected technology for the economy and society K_U01 U3: asking questions and answering issues related to the relationship between new technologies and the economy. K_U05 U4: analyzing case studies of changes taking place in the economy under the influence of industry 4.0. K_U01 K1: analytical thinking and creative search for solutions to problems K_K02 K2: use of various sources of information K_K03 K3: effective communication K_K04 Classes: W1: historical determinants of changes in the impact of technology on the economy and society K_W02 W2: selected problems of modern digital technologies and their impact on the economy and society, K_W02 W3: the effects of changes that modern digital technologies introduce into the principles of enterprise functioning and social behavior. K_W02 U1: distinguish between positive and negative	Classes conducted: - in the form of a traditional lecture with the use of presentations - a lecture with active participation of students (interaction) - in the form of exercises, conducted with a seminar lecture and a case study, required preparation for classes (reading literature), reading case studies, being active, carrying out tasks	Assessment based on the project

		factors influencing the effectiveness of implementing Industry 4.0 solutions K_U01 U2: indicating the importance of the selected technology for the economy and society K_U01 U3: asking questions and answering issues related to the relationship between new technologies and the economy. K_U05 U4: analyzing case studies of changes taking place in the economy under the influence of industry 4.0. K_U01 K1: analytical thinking and creative search for solutions to problems K_K02 K2: use of various sources of information K_K03 K3: effective communication K_K04		

	Behavioural finance	Lecture: W1: Has an in-depth knowledge of the behaviour of individual and institutional investors - K_W02 Classes: W1: Has an in-depth knowledge of the behaviour of individual and institutional investors - K_W02 U1: Has the ability to analyze financial phenomena in terms of human psychology and knows how to use statistical tools to evaluate these phenomena - K_U05	Lecture: informative lecture, problem lecture, demonstration with description, discussion, multimedia presentation. Classes: active participation in discussion, case study.	Lecture: Written exam Classes: written colloquium

	Decentralized finance and crypto-assets	Lecture: W1 - The student has knowledge of the conditions for benefiting from decentralized digital assets. (K_W01) W2 - The student has knowledge of the costs and benefits of using blockchain and DLT technologies. (K_W02) U1 - The student has the ability to use various organizational and economic concepts for decentralized methods of storing and transferring value-over-Internet as well as conducting economic activity and economic exchange in this area. (K_U01) K1 - analytical thinking and creative search for solutions to complex organizational problems that arise during business activity based on Blockchain / DLT solutions - (K_K01) Classes: W1 - The student has knowledge of the conditions for benefiting from decentralized digital assets. (K_W01) W2 - The student has knowledge of the costs and benefits of using blockchain and DLT technologies. (K_W02) U1 - The student has the ability to use various organizational and economic concepts for decentralized methods of storing and transferring value-over-Internet as well as conducting economic activity and economic exchange in this area. (K_U01) K1 - analytical thinking and creative search for solutions to complex organizational problems that arise during business activity based on Blockchain / DLT solutions - (K_K01)	Problem-based lecture, description, exercise, case study	Written exam consisting of a theoretical part and a part that checks the ability to apply the theory to solving problems. Exercises end with a credit, the basis of which are the grades obtained from the announced final tests.

	Design thinking and creative business problem solving	W1: has a basic, practical knowledge of creativity and innovation, methods and activities used in them - K_W04, K_W07, W2: has basic knowledge of tasks and procedures related to creative processes, in particular design thinking - K_W07, K_W05 U1: can independently plan activities related to the process of creative problem solving in relation to professional situations - K_U09, K_U11 U2: can design and implement team activities related to creative processes - K_U11 K1: appreciates the importance of creativity and innovation in professional activities - K_K02, K_K04	Project Case study Exchange of ideas Experiences A chat Conversation lecture Show	Tasks performed independently on the Moodle platform, Tasks performed independently and in groups during classes, Project implemented as a team in part II semester

	Public finance and tax system	Lecture: W1: The graduate knows and understands at an advanced level the economic and financial structures and their institutions as well as the key effects of the activities of these institutions in the sphere of banking and financial markets - K_W03 W2: The graduate knows and understands at an advanced level the economic and financial norms and rules that define the functioning of entities in the banking sector and financial markets - K_W04 U1: The graduate is able to use normative systems (legal, economic, social) in the area of economic and financial decisions in the sphere of banking and financial markets, taking into account the changes generated by the digitization of the economy - K_U03 Classes: W1: The graduate knows and understands at an advanced level the economic and financial structures and their institutions as well as the key effects of the activities of these institutions in the sphere of banking and financial markets - K_W03 W2: The graduate knows and understands at an advanced level the economic and financial norms and rules that define the functioning of entities in the banking sector and financial markets - K_W04 U1: The graduate is able to use normative systems (legal, economic, social) in the area of economic and financial decisions in the sphere of banking and financial markets, taking into account the changes generated by the digitization of the economy - K_U03	Lecture: organizational lecture, information lecture, problem lecture, presentation with description, discussion, multimedia presentation. Classes: active participation in the discussion, paper, case study	Written exam. Classes: final grade taking into account the assessment of the essay/presentation and test.

	Business communication II (including investor pitch)	W1: knows and understands the goals, essence, nature and interconnectedness of communication processes in the business world, including digital (K_W07) U1: using economic and financial terminology and related to the digitization of the economy, prepare speeches, using modern communication techniques (K_U07) U2: is able to use communication techniques for his own development and development of ongoing projects in the world of digital economy (K_U09) K1: is ready to critically evaluate the information received during sales presentations and other forms of speeches used in business practice (K_K03)	Case analysis, simulation game, chat, enactment, situational method, exercise method	Exercises: current activity during classes, preparation of a final presentation
	Anti-fraud, AML and KYC solutions in the digital economy and in digital assets	W1 - The student has knowledge of the conditions for gaining benefits from the regulation of decentralized digital assets. (K_W01) W2 - The student has knowledge of the costs and benefits of using compliance solutions in decentralized finance, crypto-assets and digital assets of the future. (K_W02)U1 - The student has the ability to use various technical and organizational tools for compliance in decentralized finance, crypto-assets and digital assets of the future. (K_U01) K1: analytical thinking and creative search for solutions to counteract pathologies of financial markets that can be activated during activities in decentralized finance, crypto-assets and digital assets of the future - K_K01	Description, narrative, exercises, case study	Tutorials end with a credit, the basis of which are the grades obtained from the announced two tests.

	Diploma seminar	W1: has subject matter knowledge of issues related to the digitisation of economic and financial processes - K_W02; K_W06; K_W07 W2: has advanced knowledge of methods and tools, including data acquisition techniques, used to describe structures and institutions within the digital economy - K_W01; K_W08 U1: has the ability to carry out logically coherent economic analyses of selected problems in the digital economy - K_U01; K_U02; K_U04; K_U05; K_U06 U2: has the ability to prepare typical written work in Polish in accordance with the requirements for a good thesis - K_U07 K1: enhances his/her ability to participate competently in discussions on relevant issues in the digitisation of the economy - K_K02; K_K03	The seminar method is of primary importance. Within the seminar group, all problems related to the implementation of the next steps in the development of the individual thesis are discussed.	Successive semesters of the seminar are based on: - semester I - selection of the topic, development of the structure of the thesis and writing of the first chapter of the thesis, - semester II - development and submission of a complete thesis.

Detailed allocation of ECTS credits

Academic or artistic disciplines, to which learning outcomes refer:							
	Artistic or academic discipline					**ECTS credits**	
						number	**%**
1	**Economics and Finance**					**113**	**63%**
2	**Management and Quality Studies**					**67**	**37%**
Course modules	Course	No. of ECTS credits	No. of ECTS credits in the discipline:		No. of ECTS credits for elective courses	No. of ECTS credits obtained by the student in classes conducted with direct contact with the teacher or tutor	No. of ECTS credits obtained by the student as a result of: courses related to academic activity within a discipline or disciplines, to which the field of study is assigned
			Economics and Finance	Management and Quality Studies			
Module: General education	Intellectual Property Protection	1	1	0	0	0,5	1
	Contemporary Learning Techniques	1	1	0	0	0,5	1
	Business English	7	5	2	7	5	0
	Physical Training	0	0	0	0	0	0
	Huminities lectures	6	3	3	6	3	6
	University lectures	2	2	0	2	1	2

	Occupational Safety, Health and Ergonomics	0	0	0	0	0	0
	Information Technology I	3	2	1	0	1,5	0
	Information Technology II	3	2	1	0	1,5	0
Unit Basic Subjects	Applied mathematics	7	5	2	0	3,5	7
	Statistics in economic studies	7	5	2	0	3,5	7
	Econometrics and Forecasting	7	5	2	0	3,5	7
	Introduction to economics	6	6	0	0	3	6
	Business Law	2	1	1	0	1	2
	Management	3	0	3	0	1,5	3
	Marketing and Marketing Research	3	0	3	0	1,5	3
Unit Main Course Subjects	Basics of banking and financial markets	3	3	0	0	1,5	3
	Corporate finance	7	7	0	0	4	7
	Business start-up and business plan	3	1,5	1,5	0	1,5	3
	Digital technologies in economy and finance	3	3	0	0	1,5	3
	Cybersecurity	3	1	2	0	1,5	1
	Business data visualisation	3	1	2	0	1,5	1
	Management Information Systems	4	0	4	0	2,5	4
	E-government	2	1	1	0	1	2
	Digital economy business models	4	2	2	0	3	4
	Project Management	5	0	5	0	2,5	5
	Introduction to Logistics and e-logistics tools	3	1	2	0	2	3
	Digital transformation of the economy and ESG	2	2	0	0	2	2

	Ethics in Business and Technology	2	1	1	0	1	2
	Communication in business I	3	0	3	0	1,5	3
Specialisation Data Science in Business	Introduction to scripting languages - Python and R	3	3	0	3	1,5	3
	Managing data and data systems in the organization	4	1	3	4	2	4
	Software for Business Analysis	3	2	1	3	1,5	3
	Big Data processing	4	0	4	4	2	3
	Introduction to Data Science and Machine Learning	4	3	1	4	2	4
	Association analysis	3	2	1	3	1,5	3
	Taxonomic methods in economic applications	3	2	1	3	2	3
	Predictive analytics	6	5	1	6	3	6
	Time series analysis	4	3	1	4	2	4
	Non-Classical Forecasting Methods	5	4	1	5	3	5
	Text analytics of data from social media	2	2	0	2	1	2
	Network analysis and recommender systems	4	3	1	4	2	3
	RPA and chatbots	2	1	1	2	1	1
	Data Driven Decisions	2	1	1	2	1	2
	Management and implementation of Data Science projects	2	1	1	2	1	1
	Multi-criteria mangerial decision aiding	4	0	4	4	2	4
	Statistical methods of survey data	3	0	3	3	1,5	3

	Methods and models for spatial data analyses	4	3	1	4	2	4
	Financial Econometrics	3	3	0	3	1,5	3
Specialisation Digital Innovations in Business & FinTech	Digital transformation of enterprises and transformation plan	4	2	2	4	2,5	4
	Entrepreneurship and development of startups	5	3	2	5	3	5
	Innovative projects and fundraising for R&D	6	3	3	6	3,5	6
	Legal regulations in the digital economy	6	3	3	6	4	6
	Customer Relationship Management & User Experience	6	3	3	6	3	6
	Digital banking, payment systems, and FinTech	6	6	0	6	3,5	6
	E-commerce	5	3	2	5	2,5	5
	Industry 4.0	4	2	2	4	2,5	4
	Behavioural finance	3	3	0	3	1,5	3
	Dwcentralized finance and crypto-assets	6	5	1	6	3,5	6
	Design thinking and creative business problem solving	5	3	2	5	3	5
	Public finance and tax system	4	4	0	4	2,5	4
	Business communication II (including investor pitch)	3	2	1	3	1,5	3
	Anti-fraud, AML and KYC solutions in the digital economy and in digital assets	2	2	0	2	1	2
Seminar	Diploma seminar	10	10	0	10	5	10

	Data Science in Business	180	110,5	69,5	90	96	159
	%	100%	61%	39%	50%	53%	88%
	Digital Innovations in Business&FinTech	180	115,5	64,5	90	100	163
	%	100%	64%	36%	50%	56%	91%

This study programme is effective as of the first semester of the academic year 2023/24