

Subject card

Subject name and code	Digital transformation for the environment - exercises, PG_00170012						
Field of study	Economics						
Date of commencement of studies	October 2025		Academic year of realisation of subject			2027/2028	
Education level	Bachelor's studies		Subject group			Obligatory subject group in the field of study Optional subject group	
Mode of study	full-time studies		Mode of delivery			at the university	
Year of study	3		Language of instruction			Polish	
Semester of study	5		ECTS credits			2.0	
Learning profile	academic		Assessment form			credit	
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Maria Matusiewicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	15		5.0		30.0	50
Subject objectives	The aim of the exercises is to deepen the understanding of the role of digital technologies in environmental transformation processes through the analysis of case studies, discussions and critical evaluation of digital tools and strategies used for sustainable development. Students learn to recognize the potential applications of digital solutions in the environmental context and analyze their effectiveness and limitations.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[EKONL3_K03] participates in the preparation of economic and social projects, being able to reconcile legal, economic, ecological, political and social requirements	The student is able to participate in the preparation of solutions and analyses regarding digital transformation, taking into account ecological, economic and social aspects.	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report [SK3] text preparation/written work [SK5] implementation of a problem task [SK8] observation of student's independent or team work
	[EKONL3_K05] correctly identifies, diagnoses and resolves professional dilemmas and different options for solutions	The student is able to recognize and analyze dilemmas related to the use of digital technologies in the environmental context and evaluate alternative approaches to solving them.	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report [SK3] text preparation/written work [SK8] observation of student's independent or team work
	[EKONL3_U02] is able to use the knowledge of theory and data to analyse concrete economic and social processes and phenomena and to analyse these phenomena using methods developed in economics, finance and management sciences	The student is able to use theoretical knowledge and available data to analyze the impact of digital solutions on environmental and social processes.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report [SU3] text preparation/written work [SU5] implementation of a problem task [SU8] observation of student's independent or team work
	[EKONL3_W08] has an advanced knowledge of the processes of changing elements, enterprises and whole structures of economic organisations, as well as the processes of changing social institutions, knows what their causes, course, scale, consequences are and what the influence of external stakeholders is on them	The student has knowledge of organizational and institutional changes related to the implementation of digital solutions supporting sustainable development and understands their social and economic consequences.	[SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report [SW3] text preparation/written work [SW5] implementation of a problem task
	[EKONL3_U03] is able to analyse the causes and course of specific economic and social processes and phenomena, and accurately analyse these phenomena using adequate methods and tools economic and social	The student is able to analyze the causes and course of phenomena related to digital transformation in the environmental context, using appropriate analytical tools.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report [SU5] implementation of a problem task [SU8] observation of student's independent or team work
	[EKONL3_W06] has an advanced knowledge of selected methods and tools, including statistical and econometric techniques, for describing economic agents and structures as well as social institutions and the processes taking place in them	The student knows data analysis methods and tools used to describe digitalization phenomena and their impact on the environment and social and economic institutions.	[SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report [SW3] text preparation/written work [SW5] implementation of a problem task
Subject contents	Introduction to digital transformation in the environmental context concepts, scope, examples, role in climate policies and sustainable development. Analysis of case studies of digital technologies for the environment e.g. smart cities, air quality monitoring, digital agriculture, waste management. Big Data and the environment how environmental data is collected, processed and used (discussion based on specific reports or projects). Digitalization and the circular economy (CE) how technologies support CE: resource tracking, sharing platforms, product passports. Sustainable cities and digital infrastructure analysis of the smart city concept in the environmental context (e.g. energy management, green mobility). Threats and challenges of digital transformation for the environment e.g. IT carbon footprint, electronic waste, e-inequalities. Analysis of selected documents and strategies (EU, UN, national) e.g. European Green Deal, digitalization strategies, SDG goals, ESG. The role of citizens and society in the digital environmental transformation applications for residents, open data, digital participation. Topic discussions and student presentations around specific problems or technological solutions (e.g. AI and climate change, blockchain and emission tracking). Any doubts regarding the interpretation of the issues raised will be explored during the consultations.		
Prerequisites and co-requisites			

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	participation in discussion	51.0%	20.0%
	to prepare a study of one of the topics and present it	51.0%	80.0%
Recommended reading	Basic literature	• European Commission. (2020). <i>Shaping Europe's Digital Future</i>. [Dostęp online: https://digital-strategy.ec.europa.eu] oficjalny dokument UE dotyczący cyfrowej transformacji z odniesieniami do środowiska i zrównoważonego rozwoju. • World Economic Forum. (2021). <i>Digital Transformation: Powering the Green Economy</i>. raport opisujący, jak transformacja cyfrowa wspiera cele środowiskowe, zwłaszcza w przemyśle i miastach.	
	Supplementary literature	OECD, <i>Digitalisation and the Environment: Opportunities and Challenges</i> , https://www.oecd.org/en/topics/digitalisation-and-the-environment.html	
	eResources addresses		
Example issues/ example questions/ tasks being completed	What are the greatest opportunities and threats related to digital transformation for the environment? - analysis of case studies (e.g. digital twin cities, remote air monitoring, e-waste). Do digital technologies really support sustainable development or do they just sell green? - group work: comparison of examples of greenwashing vs. green tech. How can cities use data to improve the quality of the environment? - development of the concept of smart solutions for transport, energy or waste management. Digital carbon footprints - is digitalization climate neutral? - analysis of data on emissions from data centers, cryptocurrencies, streaming, AI. What role can citizens play in digital environmental protection? - review of applications, crowdsourcing of environmental data, online participation. Green deal and digital transformation - which priorities support each other and where are the conflicts? - work with EU documents: identification of synergies and tensions. How can the Internet of Things (IoT) support environmental monitoring? - Mini-project: Propose an application of IoT in a specific context (e.g. water quality, urban heat islands). Circular economy and digital technologies - analysis of dependencies. - Task: How can digital product passports affect production and recycling? Can digital spatial planning tools support adaptation to climate change? - Assessment of examples of the use of spatial data and predictive models. What digital competences are needed by future environmental specialists? - Discussion: What is missing in environmental education in the face of digital challenges?		
Work placement	Not applicable		

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