

Subject card

Subject name and code	Practical projects in environmental protection, PG_00179662						
Field of study	Environmental Protection						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
Education level	Master's studies		Subject group		Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		English		
Semester of study	4		ECTS credits		4.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Division of Didactics and Popular Science -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Aleksandra Zahorska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	30.0	0.0	0.0	0.0	30
	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	30		10.0		60.0	100
Subject objectives	Developing students practical skills in the field of environmental protection through the implementation of simple research projects using modern technologies. During the course, students will work in teams, independently designing and constructing basic measurement tools and/or analyzing environmental data. The course also aims to foster digital, research, and communication competences through the preparation and presentation of results in the form of a scientific poster.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OŚMU2_U10] Uses Polish/English in the field of environmental protection in accordance with the requirements specified for level B2+ of the Common European Framework of Reference for Languages.	The student uses English at the B2+ level in the context of the selected environmental protection project.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[OŚMU2_W01] Describes complex phenomena and processes occurring in nature, including those related to the spread of anthropogenic pollution.	The student describes natural phenomena and processes related to anthropogenic pollution that are central to the selected project topic.	[SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report [SW5] implementation of a problem task
	[OŚMU2_U05] Searches, selects and analyses the literature achievements of environmental sciences, including scientific journals and databases, reading and understanding scientific texts in her/his native language and in English.	The student carries out a research project in the field of environmental protection, having first searched for, selected, and analyzed relevant literature in both their native language and English.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[OŚMU2_K07] Is willing to undertake individual and team activity; to professionally plan and organise its course and set priorities for their actions.	The student works both individually and as part of a team to carry out an environmental project. This involves planning, designing a research tool, conducting experimental research and/or analyzing experimental data or data generated using the EPI Suite software. The student organizes their own work and that of the group or pair, setting priorities to effectively implement the environmental project.	[SK1] oral statement/conversation/discussion [SK5] implementation of a problem task [SK8] observation of student's independent or team work
Subject contents	Students will explore the potential applications of Arduino boards, 3D printers, and EPI Suite software in the context of monitoring and analyzing environmental parameters.		
Prerequisites and co-requisites	Intermediate knowledge of English		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	implementation of a research project	51.0%	70.0%
	scientific poster	51.0%	30.0%

Recommended reading	Basic literature	Arduino i mikrokontrolery w praktyce: - Banzi, M., & Shiloh, M. (2014). <i>Getting Started with Arduino: The Open Source Electronics Prototyping Platform</i>. Maker Media. - Monk, S. (2013). <i>Programming Arduino: Getting Started with Sketches</i>. McGraw-Hill. Druk 3D i modelowanie CAD: - Průša, J. (2017). <i>Prusa 3D Printers User Manual</i>. Prusa Research (dostępne online). - Davies, R. (2016). <i>Mastering 3D Printing</i>. Packt Publishing. - Selections from online tutorials on TinkerCAD or Fusion 360 (available free). Ochrona środowiska i monitoring: - Miller, G.T., & Spoolman, S. (2019). <i>Environmental Science</i>. Cengage Learning. - Manahan, S.E. (2017). <i>Environmental Chemistry</i>. CRC Press. EPI Suite i modelowanie właściwości chemikaliów: - U.S. Environmental Protection Agency. (2020). <i>EPI Suite Estimation Programs Interface for Microsoft Windows (User Guide)</i>. EPA/OPPT. - Howard, P.H., & Boethling, R.S. (2017). <i>Handbook of Environmental Degradation Rates</i>. CRC Press.
	Supplementary literature	Alley, M. (2013). <i>The Craft of Scientific Presentations: Critical Steps to Succeed and Critical Errors to Avoid</i> . Springer.
	eResources addresses	
	Example issues/ example questions/ tasks being completed	During the course, students will work in teams, independently designing and constructing simple measurement tools and/or analyzing environmental data, as well as developing digital, research, and communication skills through the preparation and presentation of results in the form of a scientific poster.
Work placement	Not applicable	

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