

COURSE SYLLABUS	
Course code	1050-BU200-ISA-9201
Course name	Experimental Physics
Course version	2026L
Level of education	first cycle programme
Form and mode of study	full-time study
Study profile	general academic profile
Field of study	Civil Engineering
Specialisation	-
Organizational unit	The Faculty of Civil Engineering
Implementing unit	The Faculty of Civil Engineering
Course unit	n/a
Course groups	-
Course status	Obligatory
Language of the course	English
Study stage code	BU000-S2-ISA-1080
Number of ECTS credits	2

Part I

01. Learning outcomes and the method of conducting classes

Learning outcomes	see table "Learning outcomes"
Forms of classes and the number of hours in the semester	
laboratory	21,00 h
lectures	9,00 h

02. ECTS balance

Number of ECTS credits	2	
Course workload	Hours	ECTS
Total number of hours and ECTS credits for the course:		
Hours and ECTS credits for courses involving direct participation of academic teachers	33	1,32
Hours and ECTS credits involving student's independent work	17	0,68
Total	50	2,00

Number of hours involving direct participation of academic teachers:

Hours connected with class participation	30
Other synchronous hours	3
Total	33

Number of hours involving student's independent work:

Hours for student's independent work	17
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03. Course content

Course content	1. Measurement techniques and handling of measuring instruments. 2. Planning and execution of experiments. 3. Determining measurement uncertainties. 4. Principles of writing laboratory reports. 5. Handling and application of measuring instruments. 6. Theory of electrical circuits and Ohm's law. 7. Basics of oscillations, resonance phenomenon. 8. Basics of fluid flow. 9. Thermal expansion of solids. 10. Basics of acoustics. 11. Basics of aerodynamics.
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Table: Learning outcomes

Part I	
Knowledge	
Outcomes code	W1
Description	The student has knowledge of measurement techniques – The student knows how to use measuring instruments and understands their application in physical experiments.
Related field-of-study learning outcomes	K1_W02, K1_W26
Outcomes code	W2
Description	The student knows fundamental physical phenomena
Related field-of-study learning outcomes	K1_W02, K1_W07
Outcomes code	W3
Description	The student can analyze the results of experiments, considering measurement uncertainties.
Related field-of-study learning outcomes	K1_W02, K1_W26
Outcomes code	W4
Description	The student knows methods for determining physical constants.
Related field-of-study learning outcomes	K1_W02, K1_W26
Outcomes code	W5
Description	The student has knowledge of the principles for writing laboratory reports, including result analysis, uncertainty calculations, and correctly presenting all stages of the experiment and results.
Related field-of-study learning outcomes	K1_W26
Skills	
Outcomes code	U1
Description	The student can analyze experimental results and draw conclusions – The student can interpret experimental data, assess the quality of results, considering measurement errors and uncertainties, and draw valid conclusions based on the obtained data.
Related field-of-study learning outcomes	K1_U05, K1_U19, K1_U23
Outcomes code	U2
Description	The student can select appropriate measurement methods and tools – The student knows how to apply the correct measurement techniques and experimental tools to obtain precise results.
Related field-of-study learning outcomes	K1_U02, K1_U04, K1_U19
Outcomes code	U3
Description	The student can write laboratory reports, including analysis of results and uncertainty calculations – The student can prepare a laboratory report, covering all stages of the experiment, correctly presenting the analysis of results, uncertainty calculations, and drawing conclusions.
Related field-of-study learning outcomes	K1_U02, K1_U05, K1_U19, K1_U23
Outcomes code	U4
Description	The student can collaborate in a team and take on a leadership role – The student can effectively collaborate with other members of the experimental team and take responsibility for organizing the work of the team, leading the team to achieve a common research goal.
Related field-of-study learning outcomes	K1_U24
Social competence	
Outcomes code	K1
Description	The student recognizes the importance of theoretical knowledge in solving experimental and practical problems
Related field-of-study learning outcomes	K1_K01, K1_K03

Part I	
Outcomes code	K2
Description	The student is aware of the need to seek expert opinions – The student actively seeks expert opinions to address difficulties encountered during experiments
Related field-of-study learning outcomes	K1_K03
Outcomes code	K3
Description	The student is ready to identify strengths and areas for improvement, and independently and in cooperation with the team to draw constructive conclusions to optimize working methods and effectively solve problems.
Related field-of-study learning outcomes	K1_K01, K1_K03

Part II	
04. Year and semester of studies	
Year	2026L
Semester	2
05. Course leader and course teachers	
Course leader	Izabela Ducin
lectures	Izabela Ducin
laboratory	Izabela Ducin
06. Course objective	
Course objective	In accordance with the Course Regulations
07. Teaching methods and techniques	
laboratory	In accordance with the Course Regulations
lectures	In accordance with the Course Regulations
08. Methods of verifying learning outcomes	
Knowledge	
Outcomes code	W1
Description	The student has knowledge of measurement techniques – The student knows how to use measuring instruments and understands their application in physical experiments.
Verification methods	in accordance with the Course Regulations
Outcomes code	W2
Description	The student knows fundamental physical phenomena
Verification methods	in accordance with the Course Regulations
Outcomes code	W3
Description	The student can analyze the results of experiments, considering measurement uncertainties.
Verification methods	in accordance with the Course Regulations
Outcomes code	W4
Description	The student knows methods for determining physical constants.
Verification methods	in accordance with the Course Regulations
Outcomes code	W5
Description	The student has knowledge of the principles for writing laboratory reports, including result analysis, uncertainty calculations, and correctly presenting all stages of the experiment and results.
Verification methods	in accordance with the Course Regulations
Skills	
Outcomes code	U1

Part II	
Description	The student can analyze experimental results and draw conclusions – The student can interpret experimental data, assess the quality of results, considering measurement errors and uncertainties, and draw valid conclusions based on the obtained data.
Verification methods	in accordance with the Course Regulations
Outcomes code	U2
Description	The student can select appropriate measurement methods and tools – The student knows how to apply the correct measurement techniques and experimental tools to obtain precise results.
Verification methods	in accordance with the Course Regulations
Outcomes code	U3
Description	The student can write laboratory reports, including analysis of results and uncertainty calculations – The student can prepare a laboratory report, covering all stages of the experiment, correctly presenting the analysis of results, uncertainty calculations, and drawing conclusions.
Verification methods	in accordance with the Course Regulations
Outcomes code	U4
Description	The student can collaborate in a team and take on a leadership role – The student can effectively collaborate with other members of the experimental team and take responsibility for organizing the work of the team, leading the team to achieve a common research goal.
Verification methods	in accordance with the Course Regulations
Social competence	
Outcomes code	K1
Description	The student recognizes the importance of theoretical knowledge in solving experimental and practical problems
Verification methods	in accordance with the Course Regulations
Outcomes code	K2
Description	The student is aware of the need to seek expert opinions – The student actively seeks expert opinions to address difficulties encountered during experiments
Verification methods	in accordance with the Course Regulations
Outcomes code	K3
Description	The student is ready to identify strengths and areas for improvement, and independently and in cooperation with the team to draw constructive conclusions to optimize working methods and effectively solve problems.
Verification methods	in accordance with the Course Regulations
09. Required and recommended reading list	
Required reading	In accordance with the Course Regulations
10. Other information	
Other information	-