

Subject card

Subject name and code	Research Internship, PG_00182347						
Field of study	Physics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
Education level	Master's studies	Subject group			Obligatory subject group in the field of study		
Mode of study	full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			7.0		
Learning profile	academic	Assessment form			credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Michał Studziński				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	120.0	0.0	0.0	120
	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	120		0.0		60.0	180
Subject objectives	<p>The aim of the course is to prepare the student for independent scientific and project work through active participation in ongoing research conducted at the Faculty. The student becomes acquainted with advanced measurement equipment, experimental and numerical methods, as well as with the methodology of theoretical research including model formulation, mathematical analysis, and computer simulations. During the internship the student takes part in the work of three different research groups (3 × 40 hours + 3 × 20 hours), of which at least one is theoretical and at least one is experimental, according to individual preferences. Assignment to specific research groups is determined by the group leaders after a preliminary discussion with the student and is subject to their approval. The internship provides exposure to diverse research approaches and tools, while fostering teamwork skills, effective communication of results, and adherence to principles of scientific ethics.</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[FIZMU2_K03] is aware of the responsibility for jointly performed tasks	The student actively participates in the research activities of each of the three groups, demonstrates responsibility for the tasks assigned, and adheres to the team's agreed procedures and arrangements.	[SK2] presentation/project/paper/report [SK8] observation of student's independent or team work
	[FIZMU2_K08] is ready to form competent opinions on advanced professional issues and opinions on certain issues of public interest	The student formulates independent conclusions and opinions regarding the conducted research and argues for their significance in the context of contemporary scientific and societal issues related to physics.	[SK1] oral statement/conversation/discussion [SK3] text preparation/written work
	[FIZMU2_U08] can effectively communicate with both specialists and non-specialists in the area of study related to physics and to organize and lead discussions and debates on the subject	The student prepares and presents the results of the completed research internship in the form of a report, communicates research findings to members of the research groups, and is able to lead a discussion on their significance in the broader context of physics.	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work
	[FIZMU2_U11] is able to determine the directions of further improvement of knowledge and skills (including self-education) in the field of the selected specialization and beyond it	The student reflects on the experience gained while working in three research groups, identifies areas requiring further development, and plans future self-directed learning paths within the chosen specialization and related fields of physics.	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work
	[FIZMU2_K01] knows the limitations of his own knowledge and skills; can formulate questions precisely; understands the need for further education and other	The student identifies gaps in their own knowledge while working in different research groups, formulates research questions related to the problems under analysis, and demonstrates readiness for further self-directed learning in new areas of physics.	[SK1] oral statement/conversation/discussion [SK3] text preparation/written work [SK8] observation of student's independent or team work
	[FIZMU2_U09] can work independently or in a team	The student carries out assigned research tasks in each of the three groups, works both independently and collaboratively, and demonstrates initiative and responsibility for the assigned stages of the project.	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work [SU8] observation of student's independent or team work

Subject contents	<p>The course content is flexible, and its detailed scope depends on the choice of research groups as well as the individual interests and skills of the student. The following areas illustrate possible activities during the internship:</p> <p>Introduction to Research Work:</p> <ul style="list-style-type: none"> -Orientation in the topics and current projects of the three selected research groups (including at least one theoretical and one experimental group). -Familiarization with laboratory safety procedures, research ethics, and internal regulations. <p>Work in a Theoretical Group (content varies with specialization):</p> <ul style="list-style-type: none"> -Learning selected analytical and numerical methods. -Formulating and analyzing theoretical models, including preparation of individual calculations or computer simulations. <p>Work in an Experimental Group (content depends on available equipment)</p> <ul style="list-style-type: none"> -Preparation, calibration, and operation of advanced research apparatus. -Participation in planning and conducting measurements, collecting data, and performing preliminary data analysis. <p>Integration and Presentation of Results</p> <ul style="list-style-type: none"> -Preparing reports or summaries of work carried out in each research group. -Preparing and delivering a final presentation (e.g., a faculty seminar or popular-science talk) summarizing the internship outcomes (optional). <p>Specific tasks, methods, and schedules are set individually in consultation with the heads of the three chosen research groups after preliminary discussions with the student. The program may include both experimental and theoretical activities in proportions that reflect the students abilities and research interests.</p>														
Prerequisites and co-requisites	<p>A. Formal requirements: Completion of courses thematically related to the subject of the internship at the level of a bachelors degree and the first year of the masters program.</p> <p>B. Prerequisites: Knowledge of selected areas of physicsmechanics, thermodynamics, atomic and molecular physics, electricity and magnetism, optics, nuclear physics, condensed-matter physics, quantum physics, and mathematical physicsat the level of a bachelors degree and the first year of the masters program.</p>														
Assessment methods and criteria	<table border="1" data-bbox="448 1637 1487 1776"> <thead> <tr> <th data-bbox="448 1637 794 1675">Subject passing criteria</th> <th data-bbox="794 1637 1141 1675">Passing threshold</th> <th data-bbox="1141 1637 1487 1675">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1675 794 1709">Final report (Research Group 1)</td> <td data-bbox="794 1675 1141 1709">51.0%</td> <td data-bbox="1141 1675 1487 1709">34.0%</td> </tr> <tr> <td data-bbox="448 1709 794 1742">Final report (Research Group 2)</td> <td data-bbox="794 1709 1141 1742">51.0%</td> <td data-bbox="1141 1709 1487 1742">33.0%</td> </tr> <tr> <td data-bbox="448 1742 794 1776">Final report (Research Group 3)</td> <td data-bbox="794 1742 1141 1776">51.0%</td> <td data-bbox="1141 1742 1487 1776">33.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Final report (Research Group 1)	51.0%	34.0%	Final report (Research Group 2)	51.0%	33.0%	Final report (Research Group 3)	51.0%	33.0%
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Example issues/ example questions/ tasks being completed	1. Research Group Theoretical Example topic: Simulations of the quantum dynamics of many-body systems. 2. Research Group Experimental Example topic: Optical characterization of semiconductor materials.
Work placement	Not applicable

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