

Guidelines for implementation of the curriculum – Physics Specialisation

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These guidelines have the aim to ensure PhD students gain the knowledge and skills required for a PhD in physics, and prepare them for the doctoral exam that takes place before a PhD degree is granted. The list of exam questions will be available on the IWC PAN website summarise the requirements for IWC PAN students (*an English translation will appear soon*). They encompass a broad knowledge of physics on a basic level (the „general physics” questions) and deeper knowledge of one of several chosen sub-fields (the „specialist questions”).

Guidelines:

1. Students should ensure that they can acquire / refresh knowledge on broad basic physics, regardless of the minimum ECTS requirements. In particular, students whose MSc or equivalent was in a field different than physics should take both the following lecture courses at the beginning of their study:
 - Introduction to contemporary physics I & II
 - Foundations: quantum mechanics
2. Specific lecture requirements for each sub-field:
 - **IWC PAN: Solid state experimental** sub-field:
 - Solid state physics I & II
 - Crystal Growth: Physics, Technology and Modeling
 - **IWC PAN: Theory and simulation** sub-field:
 - Solid state physics I & II
 - Computational methods and Material Science I & II
 - Selected topics in theoretical physics: Classical and quantum electromagnetism
3. Additional lecture (promotor decision):
 - **IWC PAN: Solid state experimental** sub-field:
 - Quantum mechanics I & II
 - Electrodynamics
 - Experimental methods in physics
 - **IWC PAN: Theory and simulation** sub-field:
 - Quantum mechanics I & II
 - Electrodynamics

The school will strive to ensure these lectures repeat in each two-year cycle, so that students can attend the above lectures in the first 2 years of their PhD study.
4. Students should plan to attend other lectures deemed essential for their field by their supervisor, or required to fulfil ECTS requirements.
5. As per the Curriculum of Studies document (please try to ignore the translation errors there), students should attend at the least 4 lecture courses, including but not restricted to the above.
6. *Soft skills* courses – called “additional courses” in the curriculum. Students should endeavour to take at least one per year.
7. Specialization seminars.

1. PhD seminars. Students should endeavour to attend one of these in at least 4 semesters, and contribute presentations. Currently the choice each semester is one of:
 - Journal Club
 - Seminar on fundamental physics
2. The PhD symposium is a 2-3 day away workshop organised once per year. All PhD students should attend, all 3rd-4th year PhD students should present their research.
8. It is essential that students take part in the scientific seminars organised by their department to develop a deep understanding of the contemporary status of their field, and to gain an appreciation of the standards for a scientific presentation in their field. Moreover, this is the best environment in which to train their skills in scientific public speaking. Therefore, as part of the “specialization training” component, it is required that:
 - Students attend their department seminars every semester
 - Students present their work during this seminar once per yearThe above counts as 1 ECTS per year.

Other specific matters may be deemed necessary after consultation.

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