Guidelines for implementation of the curriculum – IFPAN Warsaw PhD School in Natural and BioMedical Sciences

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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 available on the IFPAN website summarise the requirements for IFPAN students. 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"). CFT and IWC students have their own procedure, specified by the Scientific Councils of CFT and IWC.

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
    - Introduction to contemporary physics II
2. Specific lecture requirements for each sub-field:
    - **Solid state physics** sub-field**:**
        - Solid state physics I
        - Solid state physics II
        - Physics of magnetism and superconductivity
        - Condensed matter theory
    - **Atomic and molecular physics** sub-field:
        - Molecules and photons
        - Introduction to atomic physics
        - Quantum information theory I
    - **Biophysics** sub-field:
        - Molecular biophysics I
        - Molecular biophysics II
        - A biophysics-relevant course in another institute in the School, e.g. the Nencki Institute for Experimental Biology.
        - At least one non-biophysics physics course.

    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.
3. Students should plan to attend other lectures deemed essential for their field by their supervisor, or required to fulfil ECTS requirements.
4. As per the Curriculum of Studies document, students should attend at the least 4 lecture courses, including but not restricted to the above.

5. *Soft skills* courses – called “additional courses” in the curriculum. Students should endeavour to take at least one per year.
   → *Soft skills courses will be announced during the academic year.*
6. Specialization PhD student 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 2nd and 3rd year PhD students should present their research.
7. Department/group seminars. 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/group seminars every semester
      - Students present their work during this seminar once per year

   The above counts as 1 ECTS per year.

   Please note: Attendance at the *Solid state physics* seminar at the University of Warsaw (a popular destination for our students) can count as attendance at a department seminar, but you should also plan to present your work at a more local department seminar (without the need to attend it every week).

Other specific matters may be deemed necessary after consultation.

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