

FORMAL REQUIREMENTS AND ADMINISTRATION OF DOCTORAL STUDIES

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PhD program: **Life Sciences**

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Standard study period: 4 years

Maximum length of study: 8 years

I. Requirements for Courses

- achieving **240 ECTS**
- **Core courses** ca 65 % of workload, all core courses are mandatory (see *Tab. A*)
- **Hard-skill courses** ca 20 % of workload, a minimum of **four** courses completed during the 1st and 2nd year
- **Soft-skill courses** ca 15 % of workload, a minimum of **three** courses

The list of courses is available on the CEITEC PhD School webpage: portal.muni.cz/ceitec/ceitec-phd-school/student/life-sciences/courses-training

Tab. A. Core courses

S5007	Ph.D. Thesis	obligatory each semester ¹
S5050	Field Seminar	obligatory each semester
C7777/C777en	Handling Chemical Substances	obligatory each autumn semester ¹
S5012	CEITEC PhD School Conference	obligatory each spring semester ^{1,2}
S5010	CEITEC Friday Seminar vol. 1	obligatory in the autumn semester of the 1st and 2nd year ²
S5060	CEITEC Friday Seminar vol. 2	obligatory in the spring semester of the 3rd and 4th year ²
S5013	TAC Meeting	according to the mandatory schedule (minimum three times) ¹
S5006	Lecture for the scientific community	once during the study
XD110	Stay abroad	once during the study ³
S5008	Scientific publication	once during the study

II. Requirements for Publications

- The student has to be the **first author** of at least one publication in a journal with IF **Q1**. If this journal has not IF Q1 in the given field of study, there should be two more publications in journals with IF Q1 or Q2 of which the student should be a co-author.
- For projects on which more scientific teams collaborate (and each is, for example, responsible for a different part of the expertise), **shared first-authorship is eligible**. In such a case, the student should clearly declare his/her contribution to the work and the results included.

¹ obligatory also after 4th year of study

² except during stay abroad

³ Exemptions only upon approval of doctoral board - participation in international creative project with results published or presented abroad, or direct participation in international cooperation.

- In case a student plans to publish an article in an **open-access journal** without an impact factor, immediate consultation with the members of the Executive Committee of the Life Sciences Doctoral Board is required. The committee will review the specific situation and quality of the journal and decide whether such output will meet the requirements for completing studies.
- The **affiliation** with both institutes must be listed: 1) National Centre for Biomolecular Research, Faculty of Science, Masaryk University; 2) Central European Institute of Technology, Masaryk University.

III. Requirements for Internship Abroad

- Obligatory a minimum one-month stay abroad in total during the study (ECTS according to faculty rules);
- Alternatively (after approval of the doctoral board) participation in an international creative project with results published or presented abroad or direct participation in international cooperation.

IV. Requirements for Doctoral State Exam (DSE)

- Performed in English;
- The Executive Committee, in collaboration with the supervisor, designs two specific exam topics for the state doctoral exam: **the first** one focusing either on **biological aspects** (with an emphasis on function) or **molecular aspects** (with a focus on structure), and **the second** on the **methodology** that is commonly used in the given field and relevant to the PhD candidate's dissertation. The topics are designed based on the list of general topics (see *Tab. B*), completed **hard skills courses** and in relation to the dissertation thesis topic.
- The doctoral candidate gives a presentation on 1 of the 2 topics (10 minutes) followed by discussion and further questions covering the remaining 2 topics and the area of the given discipline.

Tab. B. List of General Topics for DSE

Biological aspects	<ul style="list-style-type: none"> • general cellular and organismal functions of bio(macro) molecules • proteins – cellular structure, metabolism, transport, signalling • nucleic acids – genetic information, protein biosynthesis and its regulation, non-coding RNA, chromosomes, and telomeres • glycans – signalling, protein stabilisation, intra- & inter-cellular communication and interactions • lipids – membranes, lipid rafts
Molecular aspects	<ul style="list-style-type: none"> • composition and structure of proteins, nucleic acids, glycans, and lipids
Bioanalytical aspects	<ul style="list-style-type: none"> • sequencing of biopolymers • determining the structure of bio(macro)molecules, its hierarchical aspects (primary, secondary, tertiary, quaternary, modifications, suprastructures) • determining and quantifying interbiomolecular interactions (protein-protein interactions, protein-nucleic acid, protein-ligand) • bioinformatics – molecular property predictions, experimental data analysis, gene ontology • molecular modelling (basics of quantum mechanics, molecular mechanics)

V. Requirements for Dissertation Thesis Defence

- Performed in English (as well as the Thesis itself)

- Oral presentation (20 min) of the doctoral project results, followed by a discussion clarifying the opponents' comments and questions, further questions from the Examination Committee members, and questions from the audience.

VI. Requirements for Individual Study Plan

Tab. C. Description of study elements

Study element	Description
PhD Project/ Doctoral thesis	Research, a dissertation project, a literature search of the actual state of the topic, planning, and the scientific activities itself. A student with the supervisor defines the framework topic of the PhD project as the proposal for the entire study period.
Publication activities	Described in <i>II. Requirements for Publications</i> (above)
Conferences and academic forums	Presentation of results on scientific seminars, symposia, conferences, etc., including preparation of talks. At least one documented oral presentation in English to an appropriate scientific audience, preferentially international conference.
Theoretical training	Theoretical courses, preparation for the doctoral state exam. Recommendation: plan courses and training for the first two years; consider courses at MU/outside; identify student's knowledge gaps and what should be learned for SDE.
Internships and international cooperation	Described in <i>III. Requirements for Internships Abroad</i> (above)
Pedagogical competencies	Optional – included in the limit of Soft-skills courses, up to 150 hours through the entire doctoral studies. Recommendation: pass during the first three years.
Language competencies	Further improving English language competences, attending courses, seminars, conferences, writing publications, all in English.
Transferable skills and career development	Career development, preparation and management of projects, scientific writing, communication, other soft-skills. A minimum of three credited courses is required. Consider courses at MU/outside.

Tab. D. Study Plan by Semesters

year	semester	PhD Project/Doctoral thesis		Publication activities	Conferences and academic forums	Theoretical training				Internships and international cooperation	Pedagogical competencies	Language competencies	Transferable skills and career development
1	1 (autumn)	S5007 (recommended 25 ECTS)	• Submit TAC Members Proposal			S5050	C7777	S5010	Hard-skill course - optional				Soft-skill course - optional
	2 (spring)	S5007 (recommended 25 ECTS)	S5013 1 st TAC meeting		S5012 attendance	S5050			Hard-skill course - optional				Soft-skill course - optional
2	3 (autumn)	S5007 (recommended 25 ECTS)				S5050	C7777	S5010	Hard-skill course - optional				Soft-skill course - optional
	4 (spring)	S5007 (recommended 25 ECTS)	S5013 2nd TAC meeting 4 th or 5 th semester		S5012 attendance	S5050			Hard-skill course - optional 4 hard-skill courses completed				Soft-skill course - optional
3	5 (autumn)	S5007 (recommended 30 ECTS)	S5013 2nd TAC meeting 4 th or 5 th semester			S5050	C7777		• Application for DSE • Doctoral State Exam				Soft-skill course - optional
	6 (spring)	S5007 (recommended 30 ECTS)			S5012 poster	S5050		S5060					
4	7 (autumn)	S5007 (recommended 30 ECTS)	S5013 3 rd TAC meeting			S5050	C7777						
	8 (spring)	S5007 (recommended 30 ECTS) • Submit PhD Thesis • PhD Thesis Defence		S5008 completed	S5012 oral presentation S5006 completed	S5050		S5060		XD110 completed	S5009 completed (optional)	S5006 completed	3 soft-skill courses completed
4+	9+	S5007 (recommended 20 ECTS)	S5013 TAC meetings in 9 th , 11 th , ... semester		S5012 poster	S5050 optional	C7777						