

FORMAL REQUIREMENTS AND ADMINISTRATION OF DOCTORAL STUDIES

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PhD programme: **Bioanalytical chemistry/Bioanalytická chemie**

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General outline:

- **Semesters 1-4 (first 2 years of study)** - students work on their research project + fulfil other requirements (theoretical classes, preparing for state doctoral exam – SDE*, teaching assistance)
- **Semesters 5 – 8** – main focus on research (work on doctoral project and thesis, publications, presentations at conferences, etc.)

General requirements for all students in the programme (please see detailed requirements for the Individual Study Plan in the detailed table below):

Mandatory courses: *checked by Dean's Office*

CDB100	Ph.D. thesis /Příprava dizertační práce	<i>Enrolled every semester during entire studies, recommended 20-25 ECTS for semesters 1-4, 30 ECTS for semesters 5-8, 20 ECTS for semesters 9 +</i>
CDB0x	Programme seminar /Oborový seminář	<i>Obligatory for all 8 semesters of standard study duration (with exception of stay abroad)</i>
C7777	Handling chemical substances /Zacházení s chemickými látkami	<i>Enrolled in every year of study, every autumn semester</i>
CDB102	Teaching Assistance /Pomoc při výuce	<i>Minimum 100 contact hours total during semesters 1-4 (2-10 ECTS, minimum 20 ECTS)</i>
XD106	Lecture in the foreign language /Odborná přednáška v cizím jazyce	<i>Minimum once during studies (recommended 0 ECTS)</i>
	Placement Abroad /Zahraniční pracovní pobyt	<i>Minimum 1 month stay, min. 1 time during studies (usually 5 ECTS/month), requirement given by law Instructions for recognition of Placement Abroad: https://www.sci.muni.cz/en/students/go-abroad/recognition-of-stay-abroad (the recognition is done via IS application Internship and Stays, by creating record of the stay and request for recognition; the course is then registered by Dean's Office)</i>

Theoretical courses and all other requirements: *checked by the Head of Doctoral Board*

- **minimum 4 courses during semesters 1-4.** Passing the courses is required for application to the state doctoral examination (*)

Requirements for theoretical SDE*:

Theoretical courses

The academic training complements the research work by giving students theoretical background and developing broader perspectives on thinking about science. Each student has to take at least 4 courses. The student, with the agreement of his/her supervisor, selects courses according his/her research orientation mostly from those offered by the Faculty of Science, or within the MU. Master level courses can only be taken if these were not a part of the student's master degree. External courses are also acceptable upon approval by doctoral board. In exceptional case, individual literature study of specific topics relevant to the thesis work that are not covered by existing courses, terminated by an examination, can be included and considered to be equivalent to one regular course. All PhD students are required to attend and participate in group meetings and research seminars that take place weekly at the Department of Biochemistry and provide a forum for presentations and discussion of their ongoing research. The requirement is attendance at a total of 60 seminars during PhD studies and presentation at min. 3 seminars.

Fundamental scientific courses

C7880 Nové směry v bioanalytické chemii
 C7870 Biometrika
 C7942 Bioanalytics I – Biomacromolecules
 C7943 Bioanalytics II - Laboratory medicine
 Bi9001 Statistická analýza experimentálních dat

Specialized scientific courses

C4840 Metody značení a imobilizace biomolekul
 C7895 Hmotnostní spektrometrie biomolekul
 Bi5000 Bioinformatika
 C9100 Biosensory
 C8155 Buněčné signalizace
 E0300 Metabolické a proteinové biomarkery
 C8175 Molekulární podstata patofyziologických procesů
 C7885 Moderní kapilární elektromigrační metody

Bi8601 Pokročilé statistické metody
 C8156 Radioanalytické metody v biomedicině
 C7075 Bioanalytická chemie v laboratorní medicíně
 C6140 Optimalizace a hodnocení analytických metod
 C7175 Diagnostika DNA
 C7188 Úvod do molekulární medicíny
 DSMoIM01 Molecular Medicine
 C7187 Experimentální onkologie

(*) State doctoral examination

The state doctoral examination is designed to verify the student's general knowledge in the field and acquaintance with scholarly methods of research. A month before the examination, the student is assigned three different examination topics to study for beforehand. These topics are comprehensive and not necessarily restricted to the content of the courses. The examination has the form of a one hour interview between the doctoral student and the members of the committee. The committee announces the assessment of the examination obtained by secret voting immediately after the examination has been completed. A student who successfully passes the state examination can then advance to the dissertation defence which takes place the same day or at a later date.

Individual study plan elements		Milestones			
		Enrolment to studies (Before semester 1)	End of Semester 1	End of Semester 4	End of Semester 8 (Preparation for PhD defence)
(A) research and development activities (ca. 60 - 70 % of workload)	1. Research, dissertation project, literature search of the actual state of the topic, planning and the scientific activities itself (50%).	Define framework topic of your PhD project with your supervisor for enrolment. CHECK: Dean's office [enrolment] CDB100 for each semester (25 ECTS for semesters 1-4, 30 ECTS for semesters 5-8, 20 ECTS for semesters 9+] CHECK: Dean's office	Submit to your supervisor a research project that includes background literature review, research hypothesis, objectives, proposed methodology and time schedule. CHECK: Dean's office [CDB104]	No formal check needed	Submit PhD thesis according to instructions of Programme Board, format according to SCI MUNI requirements CHECK: Programme board, Dean's office
	2. Publications (thesis should be based on 3 papers demonstrating quality and independence of the student (15%))	No formal check needed	No formal check needed	No formal check needed	The minimum requirement is one research paper published in a journal from the first or second quartile (Q1 or Q2) of impact factor according to ISI Web of Knowledge with the student being the first author. The minimum requirement is the second publication in a journal with impact factor according to ISI Web of Knowledge with the student being the co-author. The minimum requirement is the third

					publication in a journal with the student being the co-author. CHECK: Programme board [Thesis].
	3. Presentation of results on scientific seminars, symposia, conferences etc., including preparation of talks and/or poster presentations (5 – 10 %)	No formal check needed	No formal check needed	No formal check needed	At minimum one 15-20 min documented oral presentation in English to appropriate scientific audience, preferentially international conference. CHECK: Dean's office [XD106]

(B) Specialized courses and theoretical preparation (20%)	<p>4. Theoretical courses, preparation to the state doctoral exam – SDE (15%)</p>	<p>Identify student’s knowledge gaps and what should be learned for SDE. Plan corresponding courses, trainings for the first two years. Consider courses at MU or outside. Minimum 4 credited courses are required. Selection can be changed/updated for each semester.</p> <p>CHECK: Supervisor</p>	No formal check needed	<p>Successfully pass at minimum 5 theoretical courses.</p> <p>CHECK: Dean’s office [IS.MUNI]</p> <p>Having all other requirements fulfilled (see below in this column) you can submit the application to theoretical SDE (programme board organizes SDE further).</p>	Not relevant anymore, all requirements fulfilled before.
	<p>5. Doctoral seminars (5%)</p>	<p>Enroll CDB0x (obligatory seminar for 8 semesters)</p> <p>CHECK: Student</p>	No formal check needed	<p>Presentation of the progress of thesis work at the seminar.</p> <p>CHECK: Dean’s office [4 semesters of CDB0x]</p>	<p>Get credits for CDB0x for all semesters when student works at MU in Brno. Semesters when student is at international stay abroad are excluded.</p> <p>CHECK: Dean’s office [IS.MUNI]</p>
(C) International experience and competitiveness	<p>6. Further improving of English competences (attending courses, seminars, conferences, writing publications, all in English).</p>	No formal check needed	No formal check needed	No formal check needed	<p>No formal check needed</p> <p>CHECK: Dean’s office [XD106]</p>

	7. Stay or internship abroad - mandatory participation in international cooperation.		No formal check needed	No formal check needed	Minimum is 1 month foreign stay, longer stays (3+ months) are preferred considering the topic. CHECK: Dean's office [stay abroad in IS; XD110]
(D) Pedagogical competences (15 %)	8. Teaching assistance - classrooms, exercises, advising undergrad students and comparable.	A minimum of 100 contact hours through the entire doctoral studies. Passed during first four semesters. CHECK: Student	No formal check needed	CHECK: Dean's office [IS; CDB102 minimum 20 ECTS]	Not relevant anymore, all requirements fulfilled before.
(E) Other transferrable skills.	9. Career development - As a part of the PhD program, the students are encouraged to write and submit a competitive grant proposal to obtain funding either from the Grant Agency of MU or others. In case of acceptance of the project, they take responsibility for technical execution as well as schedule and budget management.	No formal check needed Check offers of PHD TRAINING SCHOOL and outside of MU CHECK: Student	No formal check needed	No formal check needed	No formal check needed