

FORMAL REQUIREMENTS AND ADMINISTRATION OF DOCTORAL STUDIES

Version: Released and applicable since 1st December 2019 (last updated: October, 2023)

PhD programme: **Biomolecular Chemistry and Bioinformatics/Biomolekulární chemie a Bioinformatika**

Doctoral Board – head contact: Lukáš Židek, lzidek@chemi.muni.cz

General outline:

- **Semesters 1 - 4 (first 2 years of study)** - students work on their research project + fulfil other requirements (theoretical courses, 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 duties: <i>checked by Dean's Office</i> | | |
| XD100 | Ph.D. thesis /Příprava dizertační práce | 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 + |
| CB060 CC060 | NCBR seminar/Seminář NCBR | Obligatory seminar for all semesters of full-time study mode (with exception of stay abroad) |
| C7777 | Handling chemical substances /Zacházení s chemickými látkami | Enrolled every year of study, every autumn semester |
| CB030 CC030 | Teaching Assistance / Pomoc při výuce | See table for details, maximum 150 hours total during studies (recommended from 1 credit (increase by 1) to 10 ECTS) |
| XD106 | Lecture in the foreign language /Odborná přednáška v cizím jazyce | Minimum once during studies (recommended 0 ECTS) |
| | Placement Abroad /Zahraniční pracovní pobyt | 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), alternatively (after approval of Doctoral Board): participation in international creative project with results published or presented abroad or direct participation in international cooperation |
| Theoretical courses and all other requirements: <i>checked by the Head of Doctoral Board</i> | | |
| | | <ul style="list-style-type: none"> • minimum 20 credits during semesters 1-4 |

Requirements for theoretical SDE:

The state doctoral examination covers two mandatory areas:

- Biomolecular chemistry
- Bioinformatics

and one optional area out of the following:

- Biophysics
- Molecular biology and genetics
- Biochemistry
- Physical chemistry

Recommended theoretical courses

C9530 Strukturní biochemie
C7790 Počítačová chemie a molekulové modelování I
C8855 Počítačová chemie a molekulové modelování II
C2115 Praktický úvod do superpočítání
C9926 Problémy molekulových simulací
C3211 Aplikovaná bioinformatika
C7920 Struktura a funkce protein
C7925 Struktura a dynamika nukleových kyselin
C2135 Bioinformatika v praxi
C2138 Pokročilá bioinformatika
C5320 Theoretical concepts of NMR
C6770 NMR Spectroscopy of Biomolecules
C7995 Practical NMR Spectroscopy of Biomolecules
C9095 RNA metabolism
C9940 3-Dimensional Transmission Electron Microscopy (3DEM)
C9085 Protein-RNA interactions
C9925 Introduction to soft matter models of membranes and proteins
C9545 Chemical Bond Theory
S1003 Structural and molecular biology of RNA
S1004 Methods for structural characterization of biomolecules
S1008 Molecular Cell Biology
S1007 Doing structural biology with the electron microscope

| Elements of the ISP | | Milestones and their check | | | |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Enrolment to studies (Before semester 1) | Enrolment to semester (all semesters) | Theoretical State Doctoral Exam, SDE * | Preparation for PhD defence |
| (A) research and development activities (ca. 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. Also see Enrolment to semester. CHECK: Dean's office [enrolment] | XD100 for each semester (25 ECTS for semesters 1-4, 30 ECTS for semesters 5-8, 20 ECTS for semesters 9+] CHECK: Dean's office [enrolment] | If the SDE takes place on a different day than the defense, the student gives a short presentation (about 5 minutes, 3-5 slides) at the beginning of the exam where he/she presents his/her dissertation project. If the SDE takes place on the same day as the defense, the student provides the examining board with a copy of his / her dissertation. | Submit PhD thesis according to instructions of Doctoral Board, format according to SCI MUNI requirements. CHECK: Doctoral Board, Dean's office |
| | 2. Publications (thesis should be based on 3 papers demonstrating quality and independence of the student (15%)) | See Enrolment to semester. | No formal check needed | No formal check needed | At least one first-authorship paper published in journal with impact factor (IF) above the median in journal category (ISI WOS) or at least 2 first-authorship publications in journals with IF below the median. If the journal is in several categories, the highest rated category is used. The requirement is fulfilled even if the first authorship is shared with another author. Exception from these requirements needs to be |

| | | | | | |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | | approved by the Doctoral Board. CHECK: Thesis defence committee, Doctoral Board [Thesis]. |
| | 3. Presentation of results on scientific seminars, symposia, conferences etc., including preparation of talks and/or poster presentations (5%) | No formal check needed | No formal check needed | No formal check needed | At minimum one documented oral presentation in English to appropriate scientific audience, preferentially international conference. CHECK: Dean's office [XD106] |
| (B) Specialized courses and theoretical preparation (20%) | 4. Theoretical courses, preparation to the state doctoral exam – SDE (15%) | See Enrolment to semester. | 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 20 credits during semesters 1-4 required. At the beginning of each academic year (during years 1-4), the student must attend a required two-hour block lecture C7777 Working with Chemical Substances. CHECK: Student, Supervisor | Obtained at least 20 credits for theoretical courses. CHECK: Dean's office [IS.MUNI] Submit the application to theoretical SDE (Doctoral Board organizes SDE further). | Not relevant anymore, all requirements fulfilled before. |

| | | | | | |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>5. Doctoral seminars (5%)</p> | <p>See Enrolment to semester.</p> | <p>Enroll in NCBR seminar CC060 and CB060 - compulsory seminar for all semesters of full-time study mode, except semesters when the student is at a long-term stay abroad. Student presents his/her results in NCBR seminar in extent specified by seminar leader (max. once in semester).</p> <p>CHECK: Dean's office</p> | <p>No formal check needed</p> | <p>Obtained credits for CC060/CB060 for all semesters of full-time study mode. Semesters when student is at international stay abroad are excluded.</p> <p>CHECK: Dean's office [IS.MUNI]</p> |
| <p>(C) International experience and competitiveness</p> | <p>6. Further improving of English competences (attending courses, seminars, conferences, writing publications, all in English).</p> | <p>No formal check needed</p> | <p>No formal check needed</p> | <p>No formal check needed</p> | <p>CHECK: Dean's office [XD106]</p> |
| | <p>7. Stay or internship abroad - mandatory participation in international cooperation.</p> | <p>No formal check needed</p> | <p>No formal check needed</p> | <p>No formal check needed</p> | <p>Minimum is 1 month stay abroad (shorter stays can add up). Alternatively (after approval of supervisor): participation in international creative project with results published or presented abroad or direct participation in international cooperation.</p> <p>CHECK: Dean's office [stay abroad in IS; e.g. XD110]</p> |

| | | | | | |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------|
| <p>(D) Pedagogical competences</p> | <p>8. Teaching assistance - classrooms, exercises, advising undergrad students and comparable.</p> | <p>See Enrolment to semester.</p> | <p>Enroll in CB030/CC030 for 2 semesters, if fulfilled by course teaching assistance (1 semester is sufficient if total work load exceeded 150 hours within 2 semesters). Enroll in CB030/CC030 for 3 semesters if fulfilled by supervising or advising undergraduate students or by a comparable activity.</p> <p>CHECK: Student</p> | <p>No formal check needed</p> | <p>CHECK: Student fulfills CB030/CC030 required Dean's office [IS; CB030/CC030]</p> |
| <p>(E) Other transferrable skills.</p> | <p>9. Career development - preparation and management of projects, scientific writing, communication, other soft-skills.</p> | <p>See Enrolment to semester.</p> | <p>Plan corresponding courses expanding soft skill competences (e.g. S4001, S4004, S5040, S4002).</p> <p>CHECK: Supervisor</p> | <p>No formal check needed</p> | <p>No formal check needed</p> |