

FORMAL REQUIREMENTS AND ADMINISTRATION OF DOCTORAL STUDIES

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PhD programme: **Plant Anatomy and Physiology (Anatomie a fyziologie rostlin)**

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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)
- **End of 4th/5th semester – SDE (State Doctoral Exam)***
- **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: *checked by Dean's Office*

XD100	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>
Bi7434	Plant Physiology Seminar for Ph.D. students/ Seminář z rostlinné fyziologie pro DSP	<i>Obligatory for all 8 semesters of standard study duration (with exception of stay abroad)</i>
Bi0100 Bi0101	Doktorský seminář ÚEB I a II / Doctoral seminar ÚEB I and II	<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 every autumn semester during studies</i>
XD102	Teaching Assistance / Pomoc při výuce	<i>Enrolled 8 times in semesters 1-8, maximum 140 hours in total during studies (recommended 0 ECTS)</i>
XD106	Lecture in the foreign language / Odborná přednáška v cizím jazyce	<i>Minimum once during studies (recommended 0 ECTS)</i>
XD110	Placement Abroad / Zahraniční pracovní pobyt	<i>Minimum 1 month stay, min. once during studies (usually 5 ECTS/month), requirement given by law</i> 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)

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

- minimum 4 courses during semesters 1-4 with corresponding ECTS (before SDE)

(* Requirements for the Theoretical State Doctoral Exam (SDE):

Requirements for the SDE (to be passed in the middle of studies, the end of 4th/5th semester). The Doctoral Board will check following aspects:

- 1) proficiency in the **fundamentals of the broader scientific discipline**, i.e. Plant physiology and Anatomy (15% weight),
- 2) deep **understanding to the particular scientific specialization** (35% weight),
- 3) **detailed knowledge within the topic(s) of the doctoral research project** including context (50% weight).

Individual study plan elements		Milestones			
		Enrolment to studies (Before semester 1)	End of Semester 1	End of Semester 4/5 (Theoretical State Doctoral Exam, SDE *)	End of Semester 8 (Preparation for PhD defence)
(A) research and development activities (ca. 75% of workload)	1. Research, dissertation project , literature survey of the recent state of the topic, planning of experimental and research activities (60%).	<p>Topic and framework of your PhD project to be specified with your supervisor for the purpose of enrolment. CHECK: Dean's office [enrolment]</p> <p>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</p>	<p>Detailed "<u>Research project</u>" for your PhD work to be submitted to the Doctoral Board. The document of 5-10 pages containing Theoretical background, Research hypothesis and objectives, Approach-methods, Time table of research activities, Expected outcomes (publications).</p> <p>CHECK: Doctoral Board [Submitted project]</p>	<p>"A half-time thesis" (10-20 pages) to be prepared and submitted to the Doctoral Board with literature review (text may later be used as Introduction-Background to final PhD thesis), state of the PhD project, preliminary results. "Half-time thesis" is a document available to and assessed by the Doctoral Board during SDE.</p> <p>Submission of the "A half-time thesis" is recommended at the end of 4th semester. Obligatory submission is at the end of 5th semester.</p>	<p>PhD thesis to be submitted according to the instructions of Doctoral Board. Formatting of the thesis should fit formal requirements of the SCI MUNI.</p> <p>CHECK: Doctoral Board, Dean's office</p>

				CHECK: Doctoral Board [SDE assessment]	
	<p>2. Publications (PhD thesis should be based on at least 2 papers demonstrating quality and independence of the student (15%))</p>	No formal check needed	No formal check needed	<p>Formal check of the number of published/under-the-review/submitted/ prepared publictaions/manuscripts</p> <p>Publications of the student may be included in “Half-time thesis” submitted to the SDE (if relevant).</p>	<p>Two papers in IF-having journals (above the median of cluster)-<u>minimum</u> criteria: (1) One paper (a student is the first-author) published in IF-having journal, (ISI WOS platform). (2) One paper (a student is co-author) published in IF-having journal, (ISI WOS platform). CHECK: Doctoral Board [Thesis].</p>
	<p>3. Presentation of results on an international conferences etc., including preparation of talks and/or poster presentations</p>	No formal check needed	No formal check needed	<p>No formal check needed</p> <p>List of oral presentation(s) in English at an international conference, if there are any, must be included in the “Half-time thesis” for SDE</p>	<p>At least one oral presentation in English (Certification or equivalent) to appropriate scientific audience must be documented. Preferentially: international conference active participation of a student or equivalent approved by the Doctoral Board. CHECK: Dean’s office [XD106]</p>

<p>(B) Specialized courses and theoretical preparation (15%)</p>	<p>4. Theoretical courses, preparation to the state doctoral exam – SDE (15%)</p>	<p>Identification of student’s knowledge gaps and additional knowledge to get before SDE. Plan to be made for the courses, practice and trainings for the first two years. The courses at the MU or outside universities can be taken. Selection can be changed/updated for each semester.</p> <p>CHECK: Supervisor</p>	<p>No formal check needed</p>	<p>Objection is to pass successfully pass at least 8 credited theoretical courses.</p> <p>CHECK: Doctoral Board [IS.MUNI]</p> <p>A student should have all study requirements fulfilled and submit the application to theoretical SDE (Doctoral Board organizes SDE further).</p>	<p>Not relevant anymore, all requirements fulfilled before.</p>
	<p>5. Doctoral seminars</p>	<p>To enroll obligatory seminars for 8 semesters)</p> <p>Year 1-4 (1) Plant Biology Seminar I (Bi7433), (2) Plant Biology Seminar II (Bi8434), (3) Plant Biology Seminar III (Bi9435), (4) Plant Biology Seminar IV (Bi0436)</p> <p>Autumn semester</p>	<p>No formal check needed</p>	<p>CHECK: Dean’s office</p>	<p>Get credits for the seminars in all semesters when student works at the MU in Brno. Semesters when student is at international stay abroad are excluded.</p> <p>CHECK: Dean’s office [IS.MUNI]</p>

		<p>Life Sciences Seminar (XD011)</p> <p>Spring semester Life Sciences Seminar (XD010)</p> <p>CHECK: Student</p>			
(C) International experience and competitiveness (5%)	6. Further improving of English competences (attending courses, seminars, conferences, writing publications, all in English).	No formal check needed	No formal check needed	No formal check needed List of attended courses, 'English-speaking seminars and conferences' (active participation, i.e. oral presentation), must be included in the "Half-time thesis" for SDE	No formal check needed CHECK: Dean's office [XD106]
	7. Stay or internship abroad - mandatory participation in international cooperation. (5%)		No formal check needed	No formal check needed Information on intended (institution, time schedule) or already fulfilled stay (institution, time schedule) must be included into the "Half-time thesis"	Minimum length of the stay abroad is 1 month. Longer stays (about 3 months) are preferred in some topics of PhD study (where appropriate, e.g. multidisciplinary projects). CHECK: Dean's office [stay abroad in IS; e.g. XD110]
(D) Pedagogical competences (5%)	8. Teaching assistance - classrooms, exercises, advisory activities towards undergraduate students and comparable. (5%)	About 140 hours through the whole doctoral studies period. CHECK: Student	No formal check needed	CHECK: Dean's office [IS; XD102 for all semesters]	CHECK: Dean's office [IS; XD102 for all semesters]

(E) Other transferrable skills.	9. Career development - preparation and management of projects, scientific writing, communication, other soft-skills.	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
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Environmental Health Sciences - recommended theoretical courses

Plant Anatomy and Physiology - basic courses	Plant Anatomy and Physiology - special courses
Bi7270 Plant embryology Bi7270c Plant Embryology - Practice Bi8670 Principles of Plant Biotechnology Bi8670c Principles of Plant Biotechnology - Practice Bi8030 Production Biology Bi8030c Production Biology - Practice Bi0007 Ecophysiology of higher plant photosynthesis Bi0007c Ecophysiology of higher plant photosynthesis - Practice	Bi8180 Physiology and cultivation of algae and cyanobacteria Bi8180c Physiology and cultivation of algae and cyanobacteria Bi0321 Polar biology of plants Bi9001 Statistical analysis of experimental data Bi9001c Statistical Analysis of Experimental Data - Exercise Bi0077 English for Plant Biologists Bi0077c English for Plant Biologists - practice Bi5880c Advanced Methods Induced Chlorophyll Fluorescence - Exercise Bi0078 Advanced English for Plant Biologists Bi0078c Advanced English for Plant Biologists - practice Bi6130 Stress Plant Physiology Bi6130c Stress Plant Physiology - Exercise Bi8920 Fluorescence microscopy