

**Instructions for students and supervisors**

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# Duration

The Masters is composed of three parts:

1. BIO 510 (The masters thesis). The duration of this part is 12 months. If work on the thesis is interrupted by work for the other two parts of the Masters, ensure the an end date of the Masters Thesis that includes this, and note this on the Learning Agreement in advance.

2. BIO 520 (Integrated knowledge in biology). This module requires 300 hours of self-study, so has a minimum duration of 2 months (8 hours per day, five days per week, for seven and a half weeks).

3. Elective modules (20 CPs). The time used for these is of course separate from time used for BIO 510 and 520.

# The learning agreement

The learning agreement sets out the student’s programme of learning and research during their Masters. It should be well thought out and carefully planned, such that changes are unecessary. All sections should be completed before the signature of the Masters Coordinator is sought.

# Extensions

Due to fairness, the total duration of a Master's project is one year, and not more except in exceptional circumstances. The fairness goes in both directions: students must be treated equally, but the should also not be overburdened by a project that (perhaps unexpectedly) requires more work than reasonably fits within one year. If a student has to work for a living a significant amount of time even during the Master's project, a delay must also be planned from the start. If a project turns out to be more extensive than planned, the student must be given the possibility to finish the thesis within time, and perhaps continue the project after graduation.

Circumstances that might require and qualify for an extension include:

1. Illness / injury of student (requires a doctors note).

2. Family emergencies.

Circumstances that do not qualify for an extension include:

1. Difficulties with the research (e.g., organisms not growing, more data than expected, analyses harder than expected, taking longer to write than expected, machine breakdowns, wanting to do “just one more experiment”, etc.).

2. Busy supervisors.

3. Badly planned learning agreements (e.g., setting a handing in deadline during holidays, not anticipating important activities).

To request an extension please discuss the request with your supervisor, and then email it to the Masters Coordinator and cc your supervisor.

BIO 520 "Integrated Knowledge in Biology

## Description

This module, designed as a self-study period of the Master degree course and comprising of a total of 300 study hours (corresponding to about 2 months), allows students to demonstrate a comprehensive understanding of primarily the area of their chosen MSc specialization but also general fundamental biological concepts. The supervisor of the Master thesis discusses and designs the scope and content of the module with each individual student, with required assistance from the Masters coordinator. In general, it is expected that the student uses the opportunity to acquire a broad and solid overview in Ecology (for instance by working through an actual textbook like Begon, Harper, and Townsend, Ecology), with additional focus on the general area of their Masters Thesis research. At the end of the self-study period, the examination takes place in the form of a three-hour written and a 30-minute oral examination.

## Learning Outcomes

By the end of this module students should be able to

- demonstrate their understanding and command of relevant biological facts, methods and concepts

- identify and explain interrelationships between the various facts, methods and concepts

- summarise and critically review scientific literature efficiently and effectively

## Format of the exams

The three-hour written and the oral examination should ideally take place within one week. While an approximate date is already determined in the Learning Agreement at the start of the MSc Program, the precise dates have to be arranged on an individual basis between the thesis supervisor and the student, and communicated to the MSc coordinator. In the past, the exam has often been scheduled after completion of the Master thesis. *However, students may find it more sensible and useful to perform the study before the Masters thesis research, and to include in the essay, a thorough review of literature generally relevant to their Masters thesis (this could work well with option 1.3 for the written part, see below).* The final grade will be the arithmetic mean (rounded to half grades) of the grades obtained in the two parts.

## Part 1: Written examination

The written examination lasts 3 hours. Unless otherwise agreed, the exam takes place at the Institute of Evolutoinary Biology and Environmental Studies (IEU) in a room organized by the MSc coordinator. In that case the thesis supervisor has to make sure that the exam questions are transmitted sufficiently ahead of time to the MSc coordinator (owen.petchey@ieu.uzh.ch, Y34-J-50). Supervision of the exam is then handled by the MSc coordinator. The candidate can bring written notes, but not a complete copy of the planned essay. The examiner can (with advance notice) provide a computer (with no internet access) on which the essay can be written.

Options for the exam:

1.1 *Essay*

One option is to offer the candidate two to three general topics in the field of Ecology. She/he selects one of these, and writes a short essay (a few pages) to demonstrate her/his general knowledge in the field.

Examples of previous essay titles:

* Describe and critique a general ecological “law”.
* How are complexity and stability related?
* What is the functional significance of biodiversity?
* What factors affect how likely is a species to go extinct?
* What are the main hypotheses for why there are so many species?

1.2 *Analysis of primary literature*

The candidate will be given three primary literature papers by the thesis supervisor one week before the date of the written exam, usually in electronic form (pdf). The candidate has to read and acquire an understanding of these papers until the exam. At the exam, she/he will be asked a series of “journal club style” questions about one two, or all three of these papers. These should be answered completely and succinctly.

Examples of previously asked primary literature questions. Obviously, the questions make no sense without the paper, but you get a general idea…

* How did the authors justify the experimental design used?
* If you were the author of this paper, what would be the next experiment(s) that you would perform? Explain briefly why, and how you would perform these experiments.
* Explain the principles capture-mark-recapture methods.
* With reasoning, explain if you think appropriate statistical methods were used?
* What is one of the most significant errors or problems in the paper?

1.3 *Literature review*

A subject area within Ecology is chosen, perhaps an area that includes the Masters thesis research area, and a literature review is researched and written. The review could include documentation of previous work, critique of previous work, and synthesis of the same.

## Part 2: Oral examination

The oral exam should take place in the same week as the essay is written. The oral exam may follow a presentation of the Master thesis in a public research seminar followed by a public discussion. The Masters Coordinator or a delegate therefore must be present, in addition to the Masters supervisor. The supervisor or the MSc coordinator can also invite additional group leaders to attend the closed session.

Apart from the candidate and the Master thesis supervisor, the MSc coordinator as well as perhaps additional group leaders will participate at the oral exam. It is the responsibility of candidate and Master thesis supervisor to arrange a date with the other examiners. In addition, in case the oral exam is preceded by a public seminar presentation of the Master thesis research by the candidate, it is the responsibility of candidate and Master thesis supervisor to reserve a seminar room, organize the seminar and inform the other examiners where the seminar will take place. In special cases, the oral exam can be organized by the MSc coordinator.

## BIO520 FAQs

*1. Who selects which option (general essay, literature review, study of particular papers)?*The student and supervisor, with any require input from the masters coordinator.

*1. Who selects the publications (if this option is taken)?*

The supervisor, with any require input from the masters coordinator.

*3. How close to the topic of the Master thesis should the selected papers be?*The papers should address matters of the chosen MSc specialization (i.e. Ecology). They should not be too close to the area of the Master thesis research but they can be from the wider area of the Master thesis research.

*3. Who hands out the pdfs of the selected publications to the candidate? When are they handed out?*The Master thesis supervisor. Exactly one week ahead of the date of the written exam by e-mail to the candidate with a cc to the MSc coordinator.

*4. Who formulates the specific questions concerning the selected publications for the written exam?* Specific questions are formulated concerning one, two or all three of the selected publications by the Master thesis supervisor, but it is not excluded that they are contributed by the MSc coordinator. The Master thesis supervisor presents his/her suggestions for these specific questions to the MSc coordinator ahead of the exam.

*5. Who formulates the essay topics?*

The Master thesis supervisor and student propose essay topics to the MSc coordinator. Note that these topics have to be rather general. They should not be too closely related to the Master thesis research project, but can include it.

*6. Who is responsible that a definitive selection of questions and essay topics is available at the date* *of the written exam?*The Master thesis supervisor.

*7. Who organizes the room for the written exam and the supervision of the candidate during the written exam?*

In general, this will be the MSc coordinator. He must therefore be brought in possession of the definitive questions and essay topics at least a week before the written exam.

*8. Who corrects and grades the written exam?*The Master thesis supervisor. She/he will get the original solutions written by the candidate from the MSc coordinator and is expected to communicate the corrected exam as well as a suggestion for an appropriate grade to the MSc coordinator within about a week. The MSc coordinator has the right to modify the suggested grade.

# BIO 510 Master Thesis

The written Master thesis has to comply formally with the usual standards applied to scientific publications. The student has to hand in the final version of his Master thesis to the Studienkoordination on the date fixed in the Learning Agreement. Additional copies will have to be given to the Master thesis supervisor and to the MSc coordinator for evaluation. The supervisor should forward his evaluation report together with a suggestion for an appropriate grade for BIO 510 (full and half grades permitted) to the MSc coordinator. The coordinator has the right to ask for revisions of Master theses that do not fulfil formal standards, as well as modify the suggested grade.

The oral and written part must each be graded at least 4.0 to pass. Retaking individual components (i.e., oral or written) is possible.

## Thesis grading instructions

In general the following six criteria (A.1-3, B.1-3) are most important for grading BIO 510:

A. Thesis: Overall style, presentation, logic, language, completeness

A.1 Introduction:

- Concise overview of the research field relevant to the Master thesis focussed towards an explanation of the significance of the Master thesis research within this field

- Clear description of the problem addressed in the thesis, and clear statement of the project goals

A.2 Results and Methods:

- Clear description of the logic and hypotheses underlying the choice of performed experiments

- Clear presentation and correct interpretation of the experimental results

- Clear description of the methods used such that all experiments can be reproduced by others

A.3 Discussion and Conclusions:

- Concise discussion of the obtained results with respect to the original goals

- Discussion of the results into a more general context within the research field

- Formulation of new hypotheses, outlook for future work

Note that the supervisor should base his grade recommendation on a version of the Master thesis that has not yet been corrected by the supervisor or (other experienced scientists) and that is considered to be the final version by the student. Upon request, the MSc coordinator is entitled to inspect this first final version. However, subsequent revision in response to comments by the supervisor (or experienced scientists) is permitted and in fact an important element of learning and teaching of the MSc program.

B. Practical work in the laboratory: Overall attitude, motivation, input, independence

B.1 Lab work:

- High quality and conclusiveness of experimental work

- Independent organization of experimental procedures

- Solid understanding of the theory behind experimental techniques

- Detailed and traceable documentation of the experimental work in the lab note book

B.2 Experimental design:

- Independent interpretation and design of experiments

- Understanding of the purpose, possibilities and limitations of the applied experimental techniques

B.3 Communication:

- Communicative attitude in the laboratory

- Ability to ask for and make constructive use of advice

- Initiation of and contribution to scientific discussions

- Clear presentation of the project and the results in group meetings and during a contingent Master thesis defence.

2.1 *Public research seminar on Master thesis project*

**The public research seminar** (about 25 minutes + 10 minutes of public discussion). Quality of the performance will be considered (among many additional points) when deciding on a grade for the Master thesis (BIO 510). The public research seminar is used as a convenient mechanism for the student to present his/her thesis work to the examiners. After the research seminar and the short public question/answer period, all guests are asked to leave the room. The final research seminar is followed by a maximum 30-minute question/answer session, in which the student’s supervisor and the MSc coordinator (or a delegate thereof) ask the student questions related to the Master thesis, to the field of specialization (i.e. Ecology) and to fundamental general biological concepts.

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| Zürich, Datum | |
|  | |

# Masterabschluss in Vertiefungsrichtung

Vorname, Name, Matrikelnummer

Mit der Vorlage ihrer/seiner Masterarbeit mit dem Titel „Titel“ (Betreuer/in: Prof./Dr.) und der Absolvierung der schriftlichen und mündlichen Prüfungen, hat Frau/Herr Name die von mir betreuten Teile ihres/seines Masterstudiums erfolgreich/ohne Erfolg abgeschlossen. Sie/Er erhielt die folgenden Noten:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Masterarbeit: BIO 5      Note\*: | | | | |
| Themenübergreifende Fachkompetenz: | BIO 520 | schriftlich | Note: | Prüfungsdatum: |
|  | BIO 520 | mündlich | Note: | Prüfungsdatum: |
|  | Gesamtnote Prüfung | | Note\*: |  |

\*ganze oder halbe Note

Sofern die übrigen Voraussetzungen ebenfalls erfüllt sind, kann Frau/Herr Name aus

meiner Sicht der Mastergrad verliehen werden.

Masterkoordinator/Masterkoordinatorin Leiter/Leiterin der Masterarbeit und/oder

Prüfungsleiter

Prof./Dr. Prof./Dr.