

Guidance for BSc and MSc Theses and Projects in Environmental Engineering

1 Purpose

This document provides a framework with basic requirements for supervising, reviewing, and evaluating

- BSc Thesis
- MSc Project
- MSc Thesis

in the BSc or MSc Environmental Engineering program at ETH. It is the responsibility of both student and supervisor to review and follow this guidance. If there is reason to deviate from recommendations in this document then this should be discussed early in the process and not last minute (e.g., asking only when submitting the final document is too late).

2 Background

Some key common requirements are fixed in this document. This document complements the official rules¹ and other guidance documents².

3 Content

The main information is summarized in Table 1. Some additional information is provided in the Appendix.

4 Comments and suggestions

Comments and suggestions are welcome should be directed to the Director of studies for Environmental Engineering (umwelting@ethz.ch).

¹ Studienreglement 2010 für den Bachelor-Studiengang Umweltingenieurwissenschaften Departement Bau, Umwelt und Geomatik vom 6. Juli 2010 und Studienreglement 2016 für den Masterstudiengang Umweltingenieurwissenschaften vom 13. Oktober 2015, Ausgabe: 20.05.2020 – 1

² Available at <https://www.baug.ethz.ch/studium/umwelting/dokumente.html>

Table 1: Basic requirements for BSc/MSc Theses and MSc Projects of Environmental Engineering students at ETH Zurich.

	BSc Thesis	MSc Project	MSc Thesis	Comments
Duration	14 weeks (50% time), 10 CP Last week of semester: final presentation and final report	14 weeks (50% time), 12 CP	6 months (100% time), 30 CP	The MSc thesis: 6 months means 28 weeks (26 weeks work time plus 2 weeks for public holidays and short time absence)
Written problem statement provided by the supervisor at the start	Required	Required	Required	
Enrollment in mystudies <u>before start</u>	Required	Required and also signed form	Required	
Formal review meetings	2 intermediate meetings 1 final presentation	2 intermediate meetings 1 final presentation	2 intermediate meetings 1 final presentation	<i><u>Suggestions:</u></i> Fix dates for these meetings already at the start. Supervisors can decide on more meetings with the student. Experience shows that it is good to have two formal intermediate meetings to identify potential problems. The first intermediate meeting allows to review the problem statement and the availability of necessary methods and tools. By the time of the second intermediate meeting the student will collected the majority of results and these can be critically discussed. Intermediate meetings provide opportunities to make changes to the original problem statement (larger changes should be agreed upon in writing). For the day-to-day supervision it is beneficial to clearly define expectations in terms of time provided by assistants to support the student. Assistants and supervisors should enable students to do excellent work – but they should not be "holding the students hands" along every step of the way. Time involvement for supervision depends on the specific project.

	BSc Thesis	MSc Project	MSc Thesis	Comments
Maximum number of pages within the written report	20 pages + Appendix	25 pages + Appendix	30 pages + Appendix	<p>Page limit refers to the main section of the thesis (Introduction, Scope and Objective, Materials and Methods, Results, Discussion, Conclusions) but it does not include the front parts, References, and Appendix.</p> <p>The maximum number of pages is a strong suggestion – it is important that students learn to communicate using a limited number of pages. If a student has a good reason to use more pages and the supervisor agrees then it is OK to go beyond the maximum number of pages.</p>
Structure of report	See Appendix	See Appendix	See Appendix	
Citations	Follow ETH "Citation Etiquette" ³	Follow ETH "Citation Etiquette" ³	Follow ETH "Citation Etiquette" ³	<p>Format must be complete and consistent.</p> <p>The "Citation Etiquette" can also be found here: http://www.umwelting.ethz.ch/download/index_EN</p> <p>Citations should follow a consistent format (e.g., Author-Date)⁴.</p>
Signed declaration of originality⁵	Required by ETH	Required by ETH	Required by ETH	The declaration has to be implemented in each written report (including its PDF).
What must be submitted at the end?	At least the electronic version and by arrangement also a hard copy	At least the electronic version and by arrangement also a hard copy	At least the electronic version and by arrangement also a hard copy	The electronic version should be submitted compiled a CD or a memory stick to the supervisor and it should include final versions of written reports, poster, presentations, raw data, computer implementations, calculations etc.

³ <https://www.ethz.ch/content/dam/ethz/main/education/rechtliches-abschluesse/leistungskontrollen/plagiarism-citationetiquette.pdf>

⁴ See for example: http://www.chicagomanualofstyle.org/tools_citationguide.html or
<http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWcitations.html#fullcitations>

⁵ <https://www.ethz.ch/content/dam/ethz/main/education/rechtliches-abschluesse/leistungskontrollen/declaration-originality.pdf>

	BSc Thesis	MSc Project	MSc Thesis	Comments
Final presentation	15 min presentation + 10 min discussion Open to public At least supervisor and one additional person (e.g., assistant)	20 min presentation + 10 min discussion Open to public At least supervisor and one additional person (e.g., assistant)	25 min presentation + 10 min discussion Open to public At least supervisor and one additional person (e.g., assistant)	Date of the final presentation should be fixed already at the start. The final presentation is usually one or two weeks before the end of the overall duration. Students should learn to communicate using a limited amount of time. If a student has a good reason to use more time and the supervisor agrees then it is OK to extend the duration of the presentation. An extension of the duration of the presentation must be explicitly agreed upon before the day of the final presentation.
Poster	Not required	Not required	Required Format: A0	Please use the ETH template for scientific posters ⁶ unless agreed otherwise with the supervisor.
Grading	Practical work: 20% Final presentation: 20% Technical report: 60%	Practical work: 20% Final presentation: 20% Technical report: 60%	Practical work: 10% Final presentation: 20% Technical report: 60% Poster: 10%	The part “practical work” includes independence during the project, organisation of work, experiments, etc. No clear definition can be provided as it depends on the type of work (e.g., lab experiments, group work, preparation and realisation of field trips).
Evaluation	Written feedback by supervisor provided to the student with the grade.	Written feedback by supervisor provided to the student with the grade.	Written feedback by supervisor provided to the student with the grade.	Some general aspects which should be taken into account can be found below.

⁶ <https://www.ethz.ch/services/de/service/kommunikation/corporate-design/vorlagen-fuer-gestaltungsbereich/wissenschaftliches-plakat.html> > "Powerpoint-Vorlagen für wissenschaftliche Plakate"

	BSc Thesis	MSc Project	MSc Thesis	Comments
Minimum duration to keep project and thesis documents after completion	2 years	2 years	2 years	The final thesis/project and background documents that were submitted by the student with the thesis (e.g., on a CD) must be archived by the responsible professorship for the indicated duration.
Possibility for external project/thesis with industry, another university, or a professor outside of IfU	Yes, but must identify responsible IfU professor who reviews the problem statement and decides on the grade	Yes, but must identify responsible IfU professor who reviews the problem statement and decides on the grade	Yes, but must identify responsible IfU professor who reviews the problem statement and decides on the grade	The on-site supervision, detailed evaluation, and suggestion for a grading must be done by the external partner. But for every student there must be a responsible professor from IfU. It is the responsibility of the IfU professor to make the final decision on the grading. In many cases the IfU professor will follow the advice of the external partner but ultimately the grade is decided by the IfU professor. It is useful to have formal intermediate meetings including the external advisor, the student, and the ETH professor (if the student is abroad then these can be done via Zoom or Skype). The students are required to give a final presentation at ETH.

5 Appendix

Generally recommended structure of a technical report of a project or thesis:

- Summary
- Introduction
- Scope and Objective
- Materials and Methods
- Results
- Discussion (can be combined with results)
- Conclusions
- References
- Appendix

Criteria which should be taken into account for report evaluation:

- Layout (20%)
 - Form
 - Text structure
- Content (80%)
 - Proposed tasks addressed in report
 - Critical discussion of data and results
 - Calculations and results
 - Discussions and conclusions
 - Summary

Criteria which should be taken into account for presentation evaluation:

- Content
- Presentation technique
- Use of media
- Expression
- General impression

Criteria which should be taken into account for poster evaluation:

- Layout
- Title
- Graphics vs. text boxes
- Expressiveness
- Content
- Conclusions
- Discussion Potential

Criteria which should be taken into account for practical work:

- Time management
- Organized approach of tasks and milestones
- Independence during work and organized interactions with advisors
- Critical assessment of approach
- Organized work in laboratory, field, or with project partners (if applicable) and orderly data and metadata management.

There are many web based resources available on writing reports, preparing posters, scientific presentations, literature search. Here are some examples:

- Advice on preparing a student report and scientific writing in general
 - ETH Lehrentwicklung und -technologie (LET):
<http://www.let.ethz.ch/docs/WissenschaftlichesSchreiben>
 - http://www.geo.uzh.ch/fileadmin/files/content/abteilungen/human/PDFs/Leitfaden_2012_v7_1_2.pdf
 - https://www1.ethz.ch/fe/education/teaching_material_secured/Wissenschaftliches_Arbeiten.pdf
 - <http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtoc.html>
- Databases for finding and downloading scientific publications and journals
 - <http://www.library.ethz.ch/Ressourcen/Zeitschriften-Zeitungen>
 - ISI Web of Knowledge (<http://apps.webofknowledge.com/>)
 - Science Direct (<http://www.sciencedirect.com>)
 - Scopus (<http://www.scopus.com/>)
 - Google Scholar (<http://scholar.google.com/>)

Further information and templates for projects and for later for the evaluation of student work have been prepared within individual professorships⁷ and are available from these professorships upon request.

⁷ e.g., Professor Hellweg (ESD), Profs. Morgenroth and Maurer (UWM), or Prof. Hajnsek (Earth observation)