

## INSTRUCTIONS FOR A MASTER'S THESIS

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<b>Degree program</b>	International Master's Degree in Epidemiology and Biomedical Data Science
<b>Faculty</b>	Medicine
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<b>Prepared by (Name, email)</b>	Miia Halonen, <a href="mailto:mia.halonen@oulu.fi">mia.halonen@oulu.fi</a> Anna Pulakka, <a href="mailto:anna.pulakka@oulu.fi">anna.pulakka@oulu.fi</a> Sylvain Sebert, <a href="mailto:sylvain.sebert@oulu.fi">sylvain.sebert@oulu.fi</a>

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## **1. GENERAL INFORMATION**

### **1.1. Purpose of the Master's thesis**

The aim of completing a Master's thesis is to equip the students with skills to conduct scientific research in epidemiology and biomedical data science. The extent of a Master's thesis is 35 credits which corresponds to approximately 6 to 9 months of work.

The aims of the thesis work are to learn an independent systematic approach in setting research hypothesis and objectives, choosing appropriate research methods, and carrying out research. The students will learn how to acquire in-depth knowledge on a specific problem or a topic in the field of epidemiology and get training in handling scientific research material, presentation of data, and reporting scientific studies. Master's thesis should demonstrate the students' familiarity with the subject matter and capability for scientific expression.

Master's thesis seminars 1 and 2 will introduce the aim and process for a Master's thesis in Epidemiology and Biomedical Data Science and guide the student in the thesis process. Master's thesis seminars correspond to 135 hours of work.

To complete the EBDS Master's thesis (40 ECTS credits) the following parts are required:

- Completing the modules Master's thesis seminar I and Master's thesis seminar II
- Completing a Master's Thesis (35 ECTS) that includes
  - Conducting a Master's thesis project
  - A Master's thesis dissertation

### **1.2 Deciding on the topic and finding a supervisor**

Students are strongly encouraged to think about the thesis in the early stage of EBDS studies, as this would enable developing ideas for research topics of interest. The thesis project may be conducted in an academic research unit at the University of Oulu, the Oulu University Hospital, or an accredited organization. Selecting and narrowing down the topic is an important phase of

preparing your Master's thesis, and a good amount of time should be used on this.

#### Finding a supervisor:

The Master's thesis project is conducted with guidance from a selected supervisor. Regular meetings with the supervisor(s) are encouraged to ensure the smooth progress of the thesis. The meetings will structure and clarify the thesis process. The student has the responsibility to find the thesis supervisor. Having a second supervisor for the thesis is recommended but not obligatory. If needed the thesis can have a third supervisor. The requirements for suitable supervisors are as follows:

- The main supervisor should be affiliated with the University of Oulu.
- The main supervisor should hold a doctoral degree.
- The second supervisor does not need to be affiliated with the University of Oulu.
- The second supervisor should hold a Master's degree or a higher degree.

#### Deciding the topic:

Students are encouraged to suggest a project of their own choice but should discuss it with the Programme Director or the Coordinator and with possible supervisor(s). Students will further define the research project and find out about the availability of data together with the supervisor(s).

The supervisor(s) will provide access to the necessary equipment and data relevant to the project. The supervisors must ensure that the data are available for the students according to the current laws and legislation. When the project has enough structure, the student will fill in the project proposal document (Annex 1, also available in the Master's thesis seminar Moodle learning environment) and upload the project for approval via Moodle (files sent via e-mail will not be considered).

### **1.3 Laturi system**

The University of Oulu utilizes electronic theses operated in the Laturi system. In Laturi it is

possible to administer the whole thesis process, i.e., supervision, plagiarism detection, evaluation, and approval, as well as electronic publishing. The use of Laturi ensures that the approval processes are consistent and that the reviewers and approvers are using the same file, which is also published and archived. All the theses are available in electronic form; theses will no longer be printed, and their accessibility will improve. Use of Laturi requires a University of Oulu O365 account. All messages created by the system are sent to O365 addresses.

After approval by the main supervisor, the student will register their new thesis work to Laturi and invite the main supervisor and possible other supervisors. See detailed instructions here: <https://laturi.oulu.fi/>

## **1.4 Research plan**

The work with Master's thesis should begin by writing a concise research plan that:

- Provides a concise description of the background of the thesis topic;
- includes the research question and the hypothesis;
- Defines realistic objectives;
- Proposes a realistic schedule for the thesis.

At this early stage, the student will narrow down the topic to prevent the work from becoming too vast as it progresses. When the objectives are clear, choosing the methods and other planning work will become easier. The student will clarify (if necessary) the logistics related to the study design, research methods, and data with the help of the supervisor(s).

**Each student will present their research plan in the Master's Thesis Seminar.** The supervisor(s) should be present in this seminar also. **The student is responsible for informing their supervisors of the time of their presentation well in advance.** Each student will peer-review two other students' research plans and give oral feedback after the research plan presentation. Specific information about the research plan presentation times and peer-review instructions can be found in the Master's Thesis Seminar Moodle Workspace.

The research plan is submitted to Laturi when approved by the main supervisor. The structure of the research plan should be no longer than 1 and a half page (*Times font 12 pts, 2cm margins, single line spacing*). It should include a maximum of five references.

Research plan will include:

- Project title
- Name of the student and the student ID
- Name of the supervisor(s)
- Date of the research plan
- Background of the research (max 200 words with 1 to 5 references)
- Research question (1 sentence)
- Hypotheses (1 sentence per tested hypothesis)
- Project objectives (1 sentence per objective)
- Schedule for the thesis
- References

## **1.5 General format and contents of the thesis dissertation**

Master's thesis dissertation in the EBDS Programme follows a monograph format. The thesis dissertation should be a maximum of 60 pages (without annexes). The thesis dissertation must be written in English and should show proficiency in academic writing. Detailed guidance for writing and formatting is provided in the "EBDS Writing Guidelines" document.

We recommend the students (and the supervisor(s)) to follow and refer to relevant checklists such as the STROBE or STREGA.

Thesis dissertation should be a maximum of 60 pages:

- The recommendation is based on a dissertation written in Times New Roman font 12pts, 2 cm margins, 1.5 line spacing).
- The examiners will not evaluate any information provided after the page limit.

Structurally, the dissertation should contain the following chapters (suggested number of pages in parenthesis):

- Title page (1)
- Abstract (1)
- Table of contents (1-2)
- List of abbreviations (1-2)
- Introduction (1-2)
- Review of literature (10 - 15)
- Research aim, objectives, and hypothesis (1-2)
- Study design, material, and methods (10 - 15)
- Results (8-10)
- Discussion (3-5)
- Conclusions (1)
- Acknowledgements (1)

Not included in the 60 pages:

- References
- Annexes

(i) The Introduction chapter motivates the reader to continue reading and clearly explains the topic of your thesis. The Introduction informs the reader about

The importance of the subject. What is of interest in this matter? What have earlier studies had to say about it? What are the knowledge gaps?

- (ii) Review of literature presents the essential background for the reader to understand your study. Your review of the literature will look at the topic from different aspects and critically appraise how previous research has addressed the topic. Earlier research is summarized in relation to the proposed study. The literature review also presents the main concepts of the research and leads logically to the aims, and methods of your study.
- (iii) The formulation of the aims/research question and hypothesis should clearly state the problem the study aims to solve, the objectives and the original (*i.e.*, before the results are obtained) research hypothesis.
- (iv) Clear formulation of the research questions will decisively facilitate the reader to follow the Study design, material, and methods section. We recommend following the structure suggested in the STOBE, STREGA, or other relevant international checklists aiming at strengthening the quality and comparability of scientific reporting in epidemiology and biomedical data science. Consistency and precision are the greatest virtue for your ‘Study design, material, and methods section’. The research object and the mode of approach selected naturally determine the content of this section. The section should include a description of the statistical methods used and the models.
- (v) The results section presents your results derived from the materials by the chosen methodology. The results should give an answer to the research question. The results from your thesis should be presented in a logical way that is easily understandable to the reader. Figures, tables, and citations should be used when appropriate to clarify and deepen the reader’s understanding of your results. You are not restricted on the number of tables and figures. You can provide (when justified) complementary results table/figure as an annex.

(vi) The final chapters, discussion and conclusions, should present the main findings of the study. However, it should not merely refer to the findings but show them summarized, considered, and assessed in view of the strengths and limitations of the study design and methods. No new results should be introduced in the final chapters; this section should be based on material already presented. Secondly, the final chapters should discuss the strengths and limitations of the study, including the validity and reliability of the results. It should also discuss the generalisation of the results. Thirdly, the final chapters should, based on the arguments presented in previous chapters, reveal the answer to the question posed in the aims section (scientific conclusions). Answers to the research questions should then be compared to the results of relevant earlier studies. Conclusions should also answer the “so what?”- question: what the implications of the scientific conclusions are made in the study.

## **1.6 Submission of the thesis dissertation**

Before submitting the dissertation, a preliminary examination by the supervisor(s) is required. It is recommended that the student and the supervisors agree together that the thesis is ready for the evaluation process.

When ready, the student submits the thesis dissertation for the evaluation process in the Laturi -system. After this step, the student can no longer make any modifications. When submitting the thesis, please read carefully and follow the instructions on the University Library web page: [https://libguides.oulu.fi/laturiguide/finalised\\_thesis](https://libguides.oulu.fi/laturiguide/finalised_thesis)

## **1.7 Plagiarism and text similarity detection**

Plagiarism means using someone else's ideas, text, results, or material without referencing the source. This kind of procedure is unethical and illegal. To discover plagiarism, the Turnitin programme is used at the University of Oulu.

Turnitin checks the student's text against a large international database of articles, journals, books, websites, and theses, and looks for similarities between the student's text and the sources in the database. It gives feedback in the student's text, where the similarity to the texts in the database is indicated as a percentage. More information about TurnitIn is available on the [university library web page](#).

It is important to remember that similarity does not necessarily indicate plagiarism. The similarity percentage is always proportional to the length of the text, i.e. for short texts the percentage can be much higher than for long ones. The similarity report also includes correct quotations and the list of references, which naturally increases the percentage. Achieving zero percentage is not required, as it can even be impossible to achieve. Turnitin Similarity is meant to be used as a tool to correct and help in the writing of academic texts, as well as detect intentional plagiarism.

It is mandatory to use Turnitin for the finalized dissertation. Finalized theses' plagiarism detection and indexing to Turnitin-systems takes place in Laturi. The main supervisor will read the report and accept or return the thesis to the student for corrections. It is possible to have the thesis pre-checked in Turnitin via Moodle, but unfinished theses should not be indexed into the Turnitin-database. Instructions and Moodle link will be provided for each year class separately.

## **1.8 Maturity test**

A maturity test is a study unit required by Section 16 of the Government Decree on University Degree, through which the student demonstrates their knowledge of their field of study and their command of the Finnish or Swedish language. The thesis included in the student's degree cannot be approved until the student has taken the maturity test. In the Epidemiology and Biomedical Data Science programme the abstract of the student's thesis serves as a maturity test. The thesis abstract is a part of the dissertation and approved by the Programme Director in Peppi after the Master's Thesis has been accepted. The abstract is written in English.

## **1.9 Evaluation and Grading**

The EBDS Master's thesis includes two parts:

- Evaluation of the student's ability to plan and implement an EBDS master's thesis.
- Evaluation of the thesis dissertation.

Both parts are equally important to demonstrate research skills and capability in pursuing academic work. The thesis is evaluated using a numerical grading scale of 0-5. In the numerical scale zero stands for a fail.

### Review process

The thesis work (ability to plan and implement a master's thesis) is reviewed by the supervisor(s). There will be one external examiner for the thesis dissertation nominated by the main supervisor and approved by the Program Director. The main supervisor will be a second reviewer for the thesis dissertation.

- The examiners will upload the thesis dissertation from the Laturi system for evaluation.
- The examiners will provide a statement within three weeks' time (21 calendar days) from the date of the submission.
- The Degree Programme Committee accepts the final grade.
- The student receives the accepted evaluation by email/Laturi after the Committee meeting.
- The student has 14 days to appeal for a decision. This can be done by contacting the EBDS Program Director via e-mail.

The characteristics of a successful academic thesis are:

- Good practice in planning and implementing a research project;
- Clear formulation of the research question;
- Logical argumentation;
- Reliable documentation following the required guidelines.
- Presentation in good English,
- Quality of the presented data

## 2 GRADUATION

After the thesis has been submitted to Laturi there are certain steps to be taken in order to graduate. The timetable including specific dates for graduation is given separately for each academic year.

### Graduation Steps:

#### 1. Updating Personal Study Plan (PSP)

- After submitting the thesis to Laturi, student updates PSP in Peppi and checks that all the courses needed in the degree are listed.

#### 2. Thesis evaluation by the supervisor and external examiner

- The examiners retrieve the dissertation from the Laturi and evaluate it.
- The examiners submit a statement in three weeks' time from the date of the submission.

#### 3. Degree Programme Committee meeting (DPC)

- DPC accepts the grade. The student gets the accepted evaluation by email or from Laturi after the meeting.
- If the student is not satisfied with the evaluation, 14 days to appeal.

#### 4. Maturity test accepted and saved to register

- In EBDS, the master´s thesis dissertation abstract is accepted as a Maturity test.
- Academic affairs will get the information from the Laturi system automatically.

#### 5. Applying for a degree certificate in Peppi´s Graduation service

- The student will check that all the courses are included and apply for a degree certificate, diploma, in Peppi's Graduation -service. There are two phases in Graduation -service:

- a. Reviewing: In the first phase proceeding straight to the degree certificate application, which is also the checking list for graduation. After sending the application, the officer will review the studies, in PSP in Peppi and credits. After that, the student will get a notification that they can send the application to be finalized.

b. Finalizing: All information related to graduation will be reviewed and graduation date confirmed. After information has been processed, the student gets notification of the acceptance and confirmation of the graduation date.

- Student needs to fill in the application for degree certificate in Peppi's Graduation - service at least seven days before the date of graduation.

## 6. Graduation:

- The faculty grants the degree.
- The official degree certificate is an electronic degree certificate that students will download from Peppi's Atomki-service for free.
- Instructions for download are available [here](#).
- Students who participate in the faculty's graduation ceremony will receive a paper copy of the certificate. Certificates will not be sent by post, and they cannot be retrieved from service points. More information about the degree certificate is available [here](#).
- For possible questions about the certificate, please, contact study.medicine(at)oulu.fi
- Information about faculty's graduation ceremony is given separately.

## ANNEXES

### ANNEX 1. Topic proposal template

<b>Topic proposal for Master's thesis</b>		
Student's name:		Starting year:
Student ID:		
E-mail:		
Topic for thesis:		
Short description/purpose of the study:		
Thesis completed at place (i.e. research unit):		
Initial timetable (i.e. 11/20–04/21):		
Desired graduation date:	Desired grade:	
Thesis supervisor:		
Organisation:	University of Oulu	
Second supervisor:		
Organisation:		
. .20 _____ Student's signature	. .20 _____ Programme Director's signature	
. .20 _____ Main supervisor's signature	. .20 _____ Second supervisor's signature	