

Some notes on the Master thesis and the rules of conduct.

Reality check

In MEMO-F-403 the goal is to prepare for the master thesis in the second master year. While there are only 5 ECTS associated with this course, there are 20 ECTS associated with the master thesis.

This means that the load of the preparation course is equivalent to the load of participating in for instance our AI course INFOF311 or any other MLG course during one semester (including the exercises, projects etc.). So you are expected to make a serious effort and provide a substantial piece of work.

This also means that the load and expectations for the Master thesis are 4 times bigger!

This observation should make it clear that you cannot complete the master thesis by working only during a single semester. You need to work both the first and second semester, organizing yourself throughout the year. Essentially the master thesis effort is equivalent to two 5 ECTS courses per semester.

The better your preparation in terms of literature, tools, code and data in the first phase (MEMO-F-403), the easier things will be in the second year for the master thesis. Try thus to make sure that you have all the puzzle pieces as it will make your life easier the following year. You can for instance already start testing things so you have no surprises when focusing on the main questions of your master thesis.

Things to consider for the master thesis

We are supervising in MLG close to 20 master theses with a small team of professors and researchers. It is impossible to closely guide each student step by step to the final document, both for this preparatory work and the master thesis.

For each topic we provide you with a description of an idea to work on and some starting papers that can get you started. It will be up to you to look for additional information, identify the parts that are important and report on them in the texts. It will be your task to write the code, make the comparisons (if relevant), visualize the results, etc.

As we always try to link the research to one of the themes currently being investigated in MLG, there are researchers/supervisors that can provide feedback on what you are reading and doing.

Yet, they also have limited time. A monthly meeting could be organised, but it makes only sense to meet if advancements are being made.

Each year we organize in March a moment to present what you have so far done for the thesis. It is a good opportunity to check how far the thesis work has advanced. Essentially, you should have by that point the main results as you need to start writing on your thesis.

If your task is to use some methods on a new problem or different data set, it is a good idea to already try the method on the data on which it was developed or tested, so you are sure the work was reproducible. As you have seen in some courses, this is not always the case.

Using code of others and just running it on a new data set or a new game is not sufficient as a master thesis work. You need to go beyond the state-of-the art.

A master thesis is not the same as the programming projects you had in the Bachelor. The ambition is to provide a scientifically relevant contribution.

What is expected in MEMO-F-403

We expect you to properly formulate the problem as well as the elements you need to provide a solution or answer a question.

We expect you to organize your work and work proactively. Do not wait until we tell you what to do (see also the rules of conduct below). If you stumble on problems, both conceptual or technical, try to find a solution before contacting the team. A master thesis is your personal work, allowing you to show what you have learned and how you can go beyond the state of the art. Show that you are the master of a topic (You are getting the title of Master in the end).

In general the preparation document should contain:

1. A few pages defining the context of the area you are working in,
2. A description of the problem (s), properly formulated as scientific questions
3. An explanation on what is needed to address the problem in terms of methods, data, models, etc. Formulate your hypotheses.
4. Potentially a detailed explanation of the methods if they go beyond the basic knowledge we have about AI, ML and related fields
5. A motivation of why certain choices are made.
6. A plan on how you will organize your master thesis year. This includes
 - a. A discussion of milestones, i.e. when you want to achieve what goal
 - b. The potential risks and how you plan to mitigate them
7. A correctly formatted bibliography (which contains only the citations used in the rest of the text)
 - a. Only scientific articles need to be included in the bibliography
 - b. Websites can be referred as footnotes in the text
 - c. Reports or other sources of information also as footnotes

Rules of conduct for MA thesis students in MLG

1. The student must prepare and maintain a **Google doc portfolio document** (to be shared with the supervisor and the researchers associated with the topic) about the advances of the MA thesis. In particular, the document must contain
 - a. Your name, email and academic year
 - b. Title of your MA thesis
 - c. Log of historical activities (including dates): reading of state-of-the-art documents, attended seminars, recent meetings with supervisors, software developments, document writing
 - d. Short term planning (next month)
 - e. Long term planning (up to the defence date)
 - f. Links to presentations made during the meetings
 - g. Links to Overleaf drafts of thesis manuscript, including bibliography
 - h. Links to GitHub repository
 2. The student is responsible to solicit regularly (at least each 3/4 weeks) for a meeting with the supervisors to discuss and present the thesis advancements. In case (s)he is not able to work on the thesis for a long period, this should be communicated to promoter asap.
 3. The student should be registered to the relevant machine learning and AI classes (INFOF409, INFOF422, ...) and attend them regularly.
 4. For MA-INF1 students: only students having in the MA1 “Preliminary work” a grade greater than **12/20** will be allowed to continue their thesis in MA2.
 5. Doing the MA1 preparatory work and the MA2 thesis during the same academic year is forbidden.
 6. The Preparatory work and the MA thesis should be written in Latex (preferably in English) by using the tool Overleaf <https://www.overleaf.com>: the link should be shared with supervisors and promoters.
 7. Some examples of outstanding preparatory work made by a MLG MA thesis students are
 - a. <https://tinyurl.com/yc4dtdw6>.
 - b. See also section above, “**what is expected in MEMO-F-403**”
 8. A template of the MA thesis is available <https://tinyurl.com/2p8z8yv6>. We insist on the importance of having a
 - a. **Notation sheet** whose conventions should be respected throughout the entire manuscript.,
 - b. **Sections** in the Introduction chapter clearly defining the problem, the hypothesis and the contributions.
- Also, it is highly recommended to refer to the **reproducibility checklist** in <https://www.cs.mcgill.ca/~jpineau/ReproducibilityChecklist.pdf> to report the results of learning experiments performed in the thesis.
9. Students in MA2 are asked to **present in March the advances** of their work to MLG researchers.
 10. Final thesis documents (both MA1 and MA2) may be submitted for defense **only after explicit agreement by the promoter**. The student should be aware that the revision of

the final document may take up to 2 weeks and must include this revision time in the submission schedule.

11. From the **DI regulation**: *“The candidate must have the explicit agreement of his/her promoter to submit the thesis and the agreement of the adviser should only be given if the adviser judges that the work has enough qualities so that it is expected to convince the jury. If this agreement cannot be obtained, and if the student still wishes to defend his/her thesis, the jury will be officially informed of this fact by the secretary's office before the defense.”*
12. A specific issue concerns students submitting in the **second session** since the deadline is typically around August 15th i.e. just after the supervisor' vacations. In this case the student should make sure to contact the supervisor in order to check that he will have enough time for review. A submission in the second session without an explicit agreement of professor will imply the rejection of the document by the jury.
13. **Final assessment** of the thesis work will take into consideration
 - a. the contribution of the thesis w.r.t. initial objectives (8/20),
 - b. the quality of the manuscript (6/20),
 - c. the quality of the oral defense (2/20),
 - d. as well as the quality and the frequency of the interaction (e.g. regular update of the portfolio) (4/20).
14. Useful links:
 - a. <https://bib.ulb.be/fr/bibliotheques/bst/aide-et-formations>
 - b. <https://bib.ulb.be/fr/support/boite-a-outils/evitez-le-plagiat>

The student (last name, first name, student number, email)

.....

agrees to comply with those rules during the course of the Master Thesis and its preparation.

Date

Signature