

EAAE E9271: M.S. Thesis

GUIDELINES FOR WRITING M.S. THESIS IN EARTH AND ENVIRONMENTAL ENGINEERING, COLUMBIA UNIVERSITY

As specified in the SEAS Bulletin, "EEE M.S. Candidates are required to carry out a research project and write a master's thesis on it". The following Guidelines are to assist you in conducting this very important part of your MS-EAAE degree. M.S. Theses are published on the EAAE Research Centers web and can be a big plus on your CV. Many high quality theses are also published as technical papers, co-authored by the M.S. candidate and his/her advisor.

1. **SUBJECT:** What will be the subject? In consultation with your advisor select a subject of intense interest to you. Something you will work on not only because it is part of your M.S. degree but also as a favorite hobby.

2. **TITLE:** Write the title, no matter how crude it is at the beginning, it can be improved later. The same goes for everything else below. It is better to put something imperfect down in writing then have the perfect concept in your head and maybe forget it later. Make the title short but informative; it should express the specific thing you plan to work on.

3. **PLAN STATEMENT:** Write a very preliminary statement (less than one page) that explains in brief and clear sentences:
 - a) Why do you think it is useful to carry out such a project: Gap in knowledge? Environmental problem that needs more investigation? Problem in the future that we should prepare for? Think and express some good reasons for undertaking this work

 - b) Objectives of the research project (so as to meet the above need); this is something like an expanded title of your project

 - c) HOW you plan to go about attaining the objectives of the project and WHAT resources you plan to use: Literature review? Experiments? The web? Visits? Calculations? Physical or mathematical modeling? Etc., etc. Remember that a plan is made to be changed with time and as new information comes in. The fact that there will be changes and that the plan is based on very preliminary information does not mean that you shouldn't put down a plan at the very beginning of your undertaking.

 - d) Scheduling of the above activities and also dovetailing them with courses you have to take, time you want off to visit family, date you want to graduate, etc.

4. SUBMIT PLAN TO YOUR ADVISOR FOR COMMENT. CONSENSUS TO BE REACHED WITH ADVISOR RE SUBJECT AND PLAN OF WORK

5. EXECUTION OF PLAN

You are now ready to proceed with carrying out the plan. As new information is collected, the plan statement changes accordingly, “will do” is changed to “have done” so that by the end of the project, the Plan Statement will change gradually to the “**Executive Summary**” of your thesis. It is called “Executive Summary” to remind you that it should be as informative, inclusive, easy to read and short as possible. Assume that it will be submitted to the busy head of a research institute or the CEO of a company who has only ten minutes to glance at it and also, “does not suffer fools gladly”.

6. THE MS THESIS

After the Title Page and the Executive Summary, there is a list of Contents, a list of Figures and a list of Tables. You can show “Acknowledgments” to people who helped you getting in the MS program and in the course of your work, including any fellow students who have helped. These are then followed by the “chapters” of your thesis, all numbered sequentially and titled appropriately, such as

1. Introduction or Background Information, 2. Subject A, 2.1 Subtitle, 2.3 Subtitle; 3. Subject B...etc, etc. 6. Discussion of Results, 7. Conclusions and Recommendations, 8. References, and finally any Appendices.

The end result should be something that you can be proud of during your career and include in your CV as one of your technical publications. Some EAEE Research Centers also produce hard copies of M.S.-EAEE Theses.

7. Figures and Tables

Each Figure has a number and a caption shown at the bottom of the Figure. A reference must be given for any Figure that was obtained from some earlier thesis or publication. Don't hesitate to redraw poor reproductions of Figures. If you produced the Figure from the data of someone else, give the reference as “Source: ref. x”. Make sure the titles and units of the x and y axis are shown clearly. If there are more than one set of data, give nomenclature either in Figure or in caption between parentheses. For Tables, same guidelines as Figures, except numbers and captions go on top of the Table.

8. References

Any time you mention any numerical facts you should note the source (“experimentally”; “calculated”, “(Hackett 1998)”, “(2). References to other people's work in text can be noted by name and year (e.g., Hackett 1998) or by number (e.g. 2). Then, under References show the full reference, either as

Hackett 1998: Hackett, J.P. and L.A. Johnson, 1998, paper title, *J. of Waste M'g't*, Vol 42,

p.13-18 (1998).

or _____

2. Hacket, J.P. and Johnson, L.A. 1998, paper title, *J. of Waste M'g't*, Vol 42, p.13- 18. (1998)

If a different format may be required for a particular journal, your thesis advisor will tell you.

8. General

Do not wait for the very end of your research to start writing the thesis. Start from the very beginning to accumulate in the same computer folder, the title, summary statement and any sections, as you write them, plus the list of references. Write down your ideas even if the first write up is crude and unpolished. Think of your writing as a sculptor: She starts with a piece of clay that, by shaping and reshaping, changes from a lump of clay and little by little becomes the object she wants it to be.

Do not be satisfied with the order and form of a sentence as you wrote it the first time. Read it and re-write it and re-read it till it satisfies you. Do not use superfluous words or sentences, it can be annoying to the readers and they decrease the value of your report. Show a section of your work to a colleague and ask for frank opinion. Bring your report draft to your advisor only after you have done all this and you are satisfied that you have done your level best. She/he will then add their input.

Remember that you have chosen to make your living in a profession where your only direct product will be a report and an oral presentation. The written word offers more opportunities for improving the final product. Therefore, even oral presentations must be well prepared in PowerPoint presentations and notes.

See some past M.S.-EAE Theses [here](#)

and Theses in Sustainable Waste Management concentration [here](#)

NJT Feb. 10, 2015