Masters' Thesis Guidelines

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Objective

- The objectives of the mandatory Masters Thesis/Project requirement is to provide a culminating educational experience, where the student, under the supervision of a faculty member, conducts an individual study employing concepts and methods learned in the program to solve a problem of significant importance from a practical or theoretical standpoint.

- The study should involve a synthesis of concepts and methods learned in more than one course, and exhibit awareness of previous work in the area of study. This requirement also aims to provide an opportunity to the student to learn and practice the means of written and oral communication. The project or thesis provides an extremely important component to the students' portfolio applied towards a future undertaking whether it be for admission to a Ph.D. program or for a leadership position in the computing industry.

Introduction

- It requires a substantial amount of work and dedication to complete a MS thesis.
- Hence it is of rather important that you select a topic that is of great interest to you.
- Your interest could be based on your future career goals, long work history in a particular field, or interest to learn something new.
- Any master thesis should represent a noticeable contribution to the applicable field.
- This implies that the student must conduct an in-depth literature survey to probe where the current state of know-how is in the selected field.

Proposal

- Only after such a review it is then appropriate to define and propose a topic and a set of clear stated objectives, in the form of a proposal.
- Such a proposal is treated formally as a short report to be considered by the committee members/guide.
- The proposal is preferably constructed by closely consulting with your major advisor.
- The proposal should clearly state the problem, detailed objectives, an in-depth literature survey, an anticipated time line, methods to be used, theories to be developed, and equipment needed.
- It is expected that such a document is drafted during the first semester of being enrolled for master thesis research. This document serves as the guide in defining your efforts toward your thesis.

General Expectations

- For a potential employer or future PhD work, a master thesis does not say much about the quality and rigor of the work carried out. One method of showing the quality and the level of contribution is to have publications.

- Therefore, it is usually expected that a master thesis results in at least one publication in a respected, peer reviewed conference proceeding and/or in a peer reviewed journal.

- It might be advisable to arrange a weekly meeting with your major advisor at the beginning of the semester. This is at minimum a weekly, one-hour meeting to discuss the progress of your research.

General Expectations

- Also, the meeting length may well be increased as you near the end of your master thesis.
- You are expected to show up in your advisor's office at those times reserved.
- It is expected that continuous progress in the form of reports is made while enrolled in thesis research. If such is not achieved for any reasonable time period.

Details of the Summary Research Plan

- Each proposal must include a written plan that summarizes the proposed effort to complete the thesis research. The research plan generally does not exceed 12 pages of text body (not including references and appendices). As a guideline the research plan should include the following:
- A title page including:
    1. The proposed thesis title
    2. Student name
    3. Student's Undergraduate Program
    4. Supervising research advisor name, institutional affiliation and location
    5. Date

Details of the Summary Research Plan

- **A table of contents**.
- **A list of specific aims (1-2 pages)**. The proposed research should have approximately three specific aims (objectives) that it intends to achieve. Each aim should be clearly stated and should represent a deliverable entity without the inclusion of multiple sub-aims.
- **Introduction/Background (1-3 pages)**. The research plan should summarize the context of the intended research. The introduction/background examines the previous work and the state-of-the-art of the investigative issues.
- **An explanation of methods and materials (1-3 pages)**. The research plan should detail a scheme for conducting the research. That scheme should detail the processes, supplies, equipment and facilities to be used.

Details of the Summary Research Plan

- Each research plan must contain a design component outline that describes how you will achieve some experiential practice with technical design. Each member of the MS/ME thesis, faculty examining committee will apply a Technical Design to the written account of the design component in the thesis.

- The thesis should identifiably incorporate aspects of the following qualified design elements which will be graded by the thesis committee using the Technical Design Rubric :

Details of the Summary Research Plan

1. Identification of the problem
2. Background research of the problem
3. Clearly stated objectives of the technical design
4. A comparative analysis of alternative solutions
5. Development of a plan to achieve the design (including a block/system diagram)
6. Design project scheduling
7. Execution of the plan
8. Verification of the design effectiveness
9. Modification of the design for optimization
10. Technical level of the project

Details of the Summary Research Plan

- **A task schedule (1 page)**. The proposed research plan should layout a schedule for the completion of the specific aims. Thoughtful attention should be given to this schedule which must coincide with course planning.
- **Formating:** The following specifications are the recommended print formatting:
  1. Text style and size - 10 or 12 point font (Arial, Helvetica or Times New Roman)
  2. 1.5 line spacing
  3. 1 inch left margin and a 0.5 inch right margin
  4. References in APA format
  5. Limit appendices to five pages maximum

Technical Design Rubric

- Identification of problem
- Research and Information Guide
- Definition of the project
- Development of a Plan.
- Verification of the design
- Project Scheduling
- Technical Level of the project

Defense

- ▶ Both MS thesis and MS project have a public oral defense. Usually the student presentation is about 30 min. with Q&A following.
- ▶ Defense committee then asks all to leave the room for a short period of time to discuss the work and the grading. The defense must be advertised to the local community.
- ▶ This is a great opportunity to bring family and friends. Students are advised to carefully rehearse and check the presentation for content, duration and to make sure all the SW and demos work.