

# 1. Graduate Student Guidelines and Policies

## General Guidelines

Keep in mind that research projects are important, and that I and the funding agencies are relying on you to make real progress.

Take your research seriously.

Be on time to all meetings.

Be available during most normal working hours for work and discussions.

Keep me updated of progress. It is your responsibility to schedule a meeting with me at least once a week. Without any updates from you, I will automatically assume you have not worked on your research.

Keep in mind that research assistants are paid to participate in research projects and are not paid to take courses. The cost of tuition toward the degree is a fringe benefit of the position. Think about your research, using extra time to read relevant journal papers and keep current with the literature. Your research activity should not be limited to your RA hours. RA is not a job, rather than a means to help you to finish your thesis. Strictly speaking, your RA assignment is for whatever task can help my research program, not necessarily for your thesis. It is my intention to help you use your time in a most efficient way towards graduation.

Do 110% of what you are asked to do.

Strive to have original research ideas.

Never use sentences from a source without referencing that source.

Keep a good record of activities in an approved notebook.

Be a good citizen: Contribute to helping other students learn to use the lab equipment safely and properly for the benefit of everyone.

## Projects and Stipend

Beginning students, that is those that have not taken the qualifying exam, are paid to work on a research project that is designed to give them experience and support some aspect of the overall research program, as well as to be used in the Master's thesis. It is not necessarily the student's final dissertation project. It is intended that the experience gained will allow the student to make rapid progress toward the Ph.D. once that project is defined by the student and myself together.

According to University policy, student stipends are provided for service to either the department or the professor supplying the stipend. In either case, up to 20 hours per week are assigned to satisfying that responsibility. The remaining time can be used at the student's discretion to advance either coursework or research toward the goal of master's or Ph.D. thesis. After passing the comprehensive exam, it is reasonable to expect that the major portion of the student's time will be used toward accomplishing research goals contributing to the development of new graduate students, investigating new research areas, collaborating with external researchers, and improving the research infrastructure.

## 2. Meeting procedures

1. Everyone should schedule a meeting with me at least once a week. Bring results, plans and ideas to the meeting.
2. Everyone should have a plan as to what they have accomplished, what they will try to get done in the coming week, and what issues need to be discussed in the meeting.
3. Each week you should prepare an in-depth discussion of your research. Your mission, progress, and paper review. The paper review should be short and present the essential ingredients of the paper, i.e. why you are reviewing it in the first place. Draw conclusions about what is relevant in the paper to your research and mission.
4. I want each of you to give serious thought to the following questions, and be prepared to discuss them.

What is the big project?

Why is the big project important?

What is your part of the project?

Why is your role in the project important?

Who funds the project?

What deadlines are there?

What are the roles of others in the project, and how do they relate to your role?

What do you expect to accomplish before graduating? There can be some error margin in here, for example I must get this done, and if there is time I will get this other thing done.

How much time do you have to accomplish your goals?

What have you accomplished so far?

Are you making progress toward publications? (Don't forget that publications are the standard for progress.)

### 3. Elements of a Ph.D. Research Project

(Parentheses contain knowledge that must be acquired by the student in course of research)

Suggestion of a problem to be solved or a question to be answered (general knowledge in some area)

Elucidation of importance of the problem or question (mature insight into that area)

Development of a novel idea to solve the problem (design techniques)

Exposition on the history of the problem and previous solutions (deep knowledge of the literature in the area)

Development of a theoretical framework for the solution (theoretical techniques)

Experimental exploration of the solution

new fabrication techniques developed (new equipment development, equipment maintenance, laboratory techniques, experimental techniques)

measurements of fabrication results and solution results

demonstration of the solution in working prototype

Theoretical modeling and explanation of results achieved (modeling techniques and software)

Dissemination of research results by journal papers and conference presentations (writing skills, presentation skills, organizational skills)

Suggestion of unexplored research directions (independent thinking)

Preparation of dissertation and final defense (organizational skills, writing skills, presentation skills)

Note on selection of research topic: In engineering, nearly all projects are based on a grant or contract to perform some kind of investigation. This is usually broadly or narrowly defined in a research proposal that has been funded. The investigator usually has considerable latitude for the work to be performed. It would be a disservice to the student for the advisor to provide every detail of the project to be performed. That is why he/she is referred to as the "advisor." The student must become adequately familiar with the project to enter a phase of growth in which he/she may define many aspects of the project, thereby performing an original contribution to the field.