

## CSC 590 Lecture Notes Week 1 Introduction to the Class

- I. This class is about how to do the research for a thesis.
  - A. The objectives in the syllabus summarize the main activities of the class.
  - B. The focus of the class is develop your thesis research, write about, and give a couple presentations about it.
  - C. The writing focuses on surveying the existing related work in your chosen topic area.
  - D. The presentations are a 5-minute short one, and a 22 minute more in depth one.
  
- II. Go over the intro material.
  - A. Wiki and surveys.
  - B. Syllabus.
  - C. Assignment 1.
  
- III. Introductions.
  - A. During class, each class member will introduce her/himself.
  - B. The introduction includes the following information:
    1. Your name.
    2. Your undergraduate background, including your major, and where and when you graduated.
    3. At what point you are in your studies, i.e., how many quarters you've been in the program.
    4. If you know the area in which you want to do your thesis work, describe it, and say why it's a cool area.
    5. If you have a specific thesis topic selected, describe it say why it's a cool idea.
    6. If you've started your thesis, say how far along you are, and who your advisor is.
    7. Any other interesting information you'd like to include about yourself.
  - C. You'll provide this information live, during the first class meeting.
  - D. After that, goto the Polylearn course page for CSC 590 and do it online:
    1. Follow the 'Collaborative Wiki' under the 'Class Member Introductions' topic
    2. Read the instructions to supply your personal background information.
  
- IV. What's research?
  - A. Coming up with an interesting and novel idea.
  - B. Seeing what else is out there like it.
  - C. If it really is a new idea, then do the work to "bring it to fruition" (more on the "fruition thing" shortly).
  
- V. What's a thesis?
  - A. One good idea worked on for six months to a year by a smart person, under the supervision of a smart advisor.
  - B. A guideline we use at Poly, which is quite common in academia, is that a thesis is "potentially publishable" piece of work.
  - C. There are also some university-level "by the book" definitions of a thesis as the "culminating experience in a Master's program" (see <http://www.rgp.calpoly.edu/gradTitleVreq.html>)

- D. And there are the mundane organization and formatting requirements, given here:  
<http://www.calpoly.edu/~rgp/gradthesis.html>

VI. So what does it mean to bring a research idea "to fruition"?

- A. This depends on the kind of work that's involved, which in turn relates to the kind of thesis you're going to produce.
- B. Generally speaking, it's step 3 of the following thesis development cycle:
1. Come up with an idea.
  2. Research related work.
  3. If the idea is sufficiently new and interesting, do the work.

VII. Types of theses, and what "the work" is for each.

- A. **project-oriented** -- the work is a specification, design, and typically implementation of some hardware or software artifact.
- B. **experimental** -- the work is the definition of an experimental methodology and carrying out the experiment.
- C. **theoretical** -- the work is the postulation of a theoretical result and its proof.
- D. **survey** -- the work is a very thorough and detailed survey of existing work, including significant critical analysis.

VIII. As a concrete example of a project-oriented thesis, here's a general thesis outline I give my students.

- A. See the attached, and online at  
[www.csc.calpoly.edu/~gfisher/students/generic-ms-outline.html](http://www.csc.calpoly.edu/~gfisher/students/generic-ms-outline.html)
1. The outline has a common form of introduction, with generic place holders for specific content.
  2. For the generic content, we work out the details at the beginning of the project, and refine as we go.
  3. The outline serves as a "project roadmap" during the course of the work.
- B. All department faculty who supervise MS students have a comparable outline and/or guidelines for what they think a thesis should look like.

IX. Some quantitative questions about a thesis.

- A. **How long should a thesis be?**
1. The correct answer is "*as long as it takes*", which is to say it can be highly variable.
  2. A practical answer is that a typical thesis is 50 to 100 double-spaced pages.
- B. **How long does it take to finish a thesis?**
1. The nominal time is two quarters, since you must sign up for two sections of CSC 599.
  2. The typical time is between two and three quarters.
- C. **How many new ideas should there be in a thesis?**
1. The answer here is pretty close to one.
  2. Often, the originating source of the new idea is your advisor, but plenty of people write MS theses with ideas of their own.
- D. **How many references should there be in a thesis bibliography?**
1. This too can vary widely, but I've always liked the guideline that says the number of references should be approximately equal to the number of pages in the thesis.

2. Many folks might think this is too high an estimate, but for my money I think it's nearly impossible to have too many references in a thesis.

X. Some qualitative questions about a thesis.

- A. How does one determine if a thesis is any good?
- B. In terms of your individual work, you will rely significantly on the judgment of your advisor, as well as your own judgment.
- C. At Poly, we have a set of quality criteria that we use to rate thesis quality.
  1. Just after the thesis defense, the thesis committee fills out a one-page sheet where they rate the thesis in terms of the criteria.
  2. A copy of the sheet is attached.
- D. If any thesis defenses happen this quarter, everyone in 590 will fill one of these out for the defended thesis(es).