CSC 590 Lecture Notes Week 1

Introduction to the Class
I. This class is about how to do research

A. Objectives in syllabus summarize activities.

B. Focus is a research topic area, write about it, give oral presentations.

C. Writing focuses on surveying related work.

D. Presentations are 5-minute and 22-minute.
II. Discussion of intro material.

A. Syllabus.

B. Wiki and survey

C. Assignment 1.
III. Class Member Introductions.

A. During class, each class member will do it.

B. Introduction includes:
Introductions, cont’d

1. Your name.

2. Undergraduate background.

3. Thesis research area.

4. How far along you are.

5. Any other interesting info.
Introductions, cont’d

C. Now that we’re done in lecture ...

Introductions, cont’d

D. Goto the 590 wiki:

1. Follow 590 PolyLearn link

2. Goto the collaborative wiki for the first course topic

3. Supply your personal background info.
Syllabus

Instructor

Gene Fisher (gfisher@calpoly.edu)

Office: 14-210, 756-2416

Office Hours: M 2-3PM, Tu 9-11AM, by appointment
Syllabus, cont’d

Prerequisites

• Co-requisite with CSC 596.

• Thesis topic chosen.

• Wait if you’re not there yet.
Syllabus, cont’d

Course Objectives

• Learn what is involved in writing a thesis.

• Learn how to do research.

• Present research orally and in writing.
Syllabus, cont’d

Course Materials

• "Textbook" is membership in ACM digital library.

• Other course material at
  www.csc.calpoly.edu/~gfisher/classes/590
Syllabus, cont’d

- Online material is organized in directories:
  - lectures
  - info
  - reference
  - examples
Syllabus, cont’d

Assignments

• There are five assignments.

• Summary:
Assignments, cont

1. Write and present a research "blurb".
2. Read and critique two theses.
3. Design research validation framework.
4. Write related work section of thesis.
5. Give 22-minute oral presentation.
Syllabus, cont’d

Exams

• No in-class exams.

• Friday final time used for presentations.

• Written assignments 3, 4, and 5 due by 5PM Friday of finals week.
Syllabus, cont’d

Lecture and Assignment Schedule

-- see last page of syllabus.
Assignment 1

**DUE:** Weeks 3 and 4

- Slides due Friday Week 3
- Oral presentation on following Monday Week 4
- Written deliverables submitted to wiki
- Topic is summary of your thesis work
IV. What’s research?

A. Come up with interesting, novel idea.

B. See what else is out there like it.

C. If it’s sufficiently novel, "bring it to fruition". (more on the "fruition thing" shortly).
Getting Started on Assignment 1

• Identify your thesis topic / research area.

• Come talk to me during office hours about it.

• If you’re "shopping", come soon.
V. What’s a thesis?

A. A good idea, worked on for a year, by a smart person, supervised by a smart advisor.

B. Another general guideline is a "potentially publishable" piece of work.
What’s a thesis?, cont’d

C. University-level "by the book" definition -- the *culminating experience*

D. Key buzzwords and phrases include:
What’s a thesis?, cont’d

• "systematic study of significant problem"

• "identifies problem, states assumptions"

• "evidences originality, critical and independent thinking"
What’s a thesis?, cont’d

E. Mundane organization and formatting rqmts:

http://www.calpoly.edu/~rgp/gradthesis.html
VI. What does it mean to bring a research idea "to fruition"?

A. Depends on kind of work involved.

B. Here’s a 3-step thesis development cycle:
Fruition, cont’d

1. Come up with an idea.

2. Research related work.

3. If 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.
Types of theses, cont’d

B. *experimental* -- the work is the definition of an experimental methodology and carrying out the experiment.
Types of theses, cont’d

C. *theoretical* -- the work is the postulation of a theoretical result and its proof.
Types of theses, cont’d

D. *survey* -- the work is a very thorough and detailed survey of existing work, including significant critical analysis.
VIII. Concrete example of project-oriented thesis outline.

A. See online example at

www.csc.calpoly.edu/~gfisher/students/generic-ms-outline.html
Concrete example, cont’d

1. Has a common form of intro.

2. Outline serves as "project roadmap".

3. Work out details and refine with advisor.
Concrete example, cont’d

B. All faculty who supervise MS students have a comparable outline and/or guidelines.
IX. Some quantitative questions about a thesis.

A. *How long should a thesis be?*

1. The correct answer is "*as long as it takes*", i.e., can be highly variable.

2. A practical answer is that a typical thesis is 50 to 100 double-spaced pages.
Quantitative questions, cont’d

B. *How long does it take to finish a thesis?*

1. The nominal time is three quarters, since you take three sections of CSC 59X.

2. Occasionally longer or shorter.
Quantitative questions, cont’d

C. How many new ideas are 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.
Quantitative questions, cont’d

D. *How many references should there be in a thesis bibliography?*

1. Approximately equal to number of pages.

2. Maybe a high estimate, but it’s nearly impossible to have too many refs in a thesis.
X. Some qualitative questions about a thesis.

A. How does one determine if it’s any good?

B. Rely significantly on the judgment of your advisor, as well as your own judgment.
Qualitative questions, cont’d

C. At Poly, we have a set of quality criteria.

1. Thesis committee fills out a one-page sheet.

2. A copy of the sheet is attached.
Qualitative questions, cont’d

D. These are the quality criteria you’ll use in Assignment 2.