Computer Science Graduate Initiation Course
CAS CS 697

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Course Overview: This two-credit course is designed to help guide entering Ph.D. students and interested Masters students across the exciting, but challenging transition into a Computer Science graduate program. Second-year Ph.D. students who have not enrolled in the course before are also encouraged to attend. Topics will range broadly across issues of research and scholarship that all Ph.D. students will face, including:

- balancing competing demands of coursework, research and teaching

- how to go about identifying and recruiting a dissertation advisor

- working effectively with an advisor and within a research group

- becoming an expert paper-reader / paper-writer / paper-reviewer

- online research resources, B.U. library resources

- tools of the trade that every Computer Science research needs to know

- building outstanding technical presentation skills

- becoming visible in a research community

- research ethics

- applying for fellowships and internships

- writing a thesis proposal and a dissertation

- finding a job and life after graduate school.

This course will not cover the more mundane details of program requirements and milestones, nor will the class provide academic advice specific to individual students in the class. For these, please consult the Graduate Student Handbook and your academic advisor, respectively.

Course Format: Weekly meetings will be led by the instructor, frequently accompanied by other faculty members and senior graduate students in the program, who will discuss their experiences. Although most weeks will consist of a lecture portion, especially on the more technical topics, there will be ample time for discussion during each class. We will meet once a week for 90 minutes.

Grading and Assignments: Letter grades will be assigned for this class. Grades will be based on completion of written assignments and reading assignments for the class, active participation in class, and attendance. The three main assignments in the class will help the student build a foundation in a research area of their choice, and are to be conducted together with, and assessed by, a faculty advisor in a research area that they are interested in pursuing.

1. The first assignment is to read and generate a conference-style review critiquing a paper chosen by the student in concert with an advising faculty member. Using a review form from a top Computer Science conference, the review will assess the paper's suitability for publication and offer constructive feedback intended to help the authors improve the paper. A post-mortem discussion of the reviews will be conducted in class.

2. The second assignment is to present a 20-30 minute talk at a group meeting outside of class. Talks are to be previewed and critiqued by an advising faculty member prior to presentation. Appropriate venues include established research group meetings or the graduate student lunch talk series. Presentations will be graded on the ability of the student to incorporate effective presentation techniques discussed in the seminar into their talk, and to communicate the main ideas and contributions of the paper effectively and clearly in the alloted time. The students may choose to present the paper that they reviewed for the first assignment.

3. The third assignment is to write a short "synthesis" paper connecting two or three research papers in a research subdiscipline, where papers are chosen in concert with an advising faculty member. A good synthesis paper briefly summarizes the main ideas in both papers (simply repeating or paraphrasing what the authors wrote is not acceptable), and then goes on to describe the connections between the papers. This connection can be described in terms of how the ideas in the papers complement each other, contradict one another, or might articulate how the ideas in the papers can be used together to create something more significant than just the "sum of the parts" of the two papers. The synthesis paper will be graded by the advising faculty member on the student's demonstrated understanding of the two papers, the student's ability to demonstrate originality in synthesizing the two works, and the overall quality and clarity of the written presentation. The papers used in the first two assignments may be re-used for this assignment.

Reading List: We will be reading numerous short articles written by computer scientists on topics including: paper writing tips, effective oral presentation, techniques for refereeing papers, interviewing, publishing your work, and ethics. Representative references include:

[1] "Useful Things to Know About Ph.D. Research," H. T. Kung, October 1987, Available online at `http://www.eecs.harvard.edu/∼htk/thesis.htm`.

[2] "The Task of the Referee," A. J. Smith, *IEEE Computer*, June 1990, pp. 65-71.

[3] "Oral Presentation Advice," M. Hill, January 1997, Available online at `http://www.cs.wisc.edu/∼markhill/conference-talk.html`.

[4] "Tips on the Faculty Interview Process," J. Wing, December 2001, Available online at `http://www-2.cs.cmu.edu/∼emigration/wing.html`.

[5] "The Cognitive Style of Powerpoint," Edward R. Tufte, Graphics Press,(2003),

In addition, we will be drawing from the following supplemental and reference texts that will be available on reserve in the Science and Engineering library.

[6] *Writing for Computer Science*, Second Edition, J. Zobel, Springer Publishing (2004).

[7] *The Elements of Style (4th Edition)*, W. Strunk Jr., E. B. White, Pearson Publishing (2000).

[8] *The Visual Display of Quantitative Information*, Chapter 9, E. R. Tufte, Graphics Press (2001).

[9] *LaTeX: A Document Preparation System (2nd Edition)*, L. Lamport, Addison-Wesley (1994).

The following short scientific novel written by a Stanford chemist offers engaging insights into academic life, especially with respect to student-faculty relationships in the sciences:

[10] *Cantor's Dilemma*, C. Djerassi, Penguin Books (1989).

Course Schedule:

Week	Topics	Readings	Assignments
Week 1	Welcome, introductions, class organization and orientation.		
Week 2	Getting started: balancing coursework, research, teaching and Ph.D. exams.	[1]	
Week 3	Advisors: advisor selection; setting, managing, and meeting expectations; building a healthy relationship.	[10]	
Week 4	Research topics: picking good problems, attending talks, working alone and in groups, collaboration in general, the value of apprenticeship.		
Week 5	Reading research papers effectively: not as easy as it sounds.		
Week 6	Reviewing the work of others.	[2]	**Written review**
Week 7	Oral presentations I: structure, scope, organization, do's and don'ts.	[3]	
Week 8	Oral presentations II: making your presentation shine.	[5, 8]	**Short talk**
Week 9	Writing I: basics and tools of the trade. LaTeX, Bibtex, CiteSeer. Plagiarism, appropriate citations,	[6, 9]	
Week 10	Writing II: generating drawings and figures, the elements of style.	[7]	**Synthesis paper**
Week 11	Ethics and professional conduct.		
Week 12	Networking. Securing internships, attending workshops, gaining visibility.		
Week 13	Finding a job; life after graduate school.	[4]	