

# CS 5392 Graduate Research Methods

## Fall 2009 Syllabus

*Schedule:* 3:00-4:20 p.m., Mondays and Wednesdays, in Room 321

*Instructor:* David Novick

**Office Hours:** By appointment (call Bea Tarango, x5480, to schedule)

*Overview:* This class is an introduction to research methods used in computer science at the graduate and undergraduate levels. It is a hands-on class: students develop a research proposal in an area of their choice. As such it will be valuable for those in the early stages of research, for example Masters students beginning to work on identifying a research topic and planning their work. It will also be useful for anyone wanting to learn how scientific research is done in practice, especially those considering doctoral studies or a research career in the field of computer science.

By the end of the semester each participant will have written an extended research proposal 10-15 (undergrad) or 15-20 (graduate) double spaced pages in length, complete with motivation, review of relevant literature, research question, and method.

### Texts

The Elements of Style, Fourth Edition (Paperback), by William Strunk Jr., E.B. White, Roger Angell. (Longman)

### Course Outcomes

#### Description/Requirements/Contact Hours

Introduction to research methods, including research paradigms and methodologies across computer science, research question formulation, design of research approach, literature search and presentation of related work, analysis of results, verbal and written presentation skills, and research ethics. Students prepare and defend a thesis proposal or project proposal in an area of their choice. Class meets three hours per week, a total of 45 hours per semester.

#### Knowledge and Comprehension

- Know how to find literature relevant to a problem
- Know how to read and explain a research paper
- Know methods for finding and formulating research questions
- Know when to use the principal research methods common in computer science, such as formal proof, benchmarking, simulation, and experimentation
- Be aware of common ethical issues in research

- Know when to submit a research protocol for human subjects
- Know simple approaches to good writing for research papers, theses and dissertations
- Know how to use a style guide for theses and dissertations
- Know how present a research talk

### **Application and Analysis**

- Think critically about research questions and methods
- Answer questions about a research paper
- Find and formulate research questions

### **Synthesis and Evaluation**

- Write a research proposal, including introduction, literature review, and methodology sections
- Prepare and present a research poster
- Defend a research proposal

### **Standards of Conduct**

You are expected to conduct yourself in a professional and courteous manner, as prescribed by the UTEP Standards of Conduct. Graded work, such as homework and tests, is to be completed independently and should be unmistakably your own work, although you may discuss your project with other students in a general way. You may not represent as your own work material that is transcribed or copied from another person, book, or any other source, e.g., a Web page. The instructor is required to—and will—report academic dishonesty and any other violation of the Standards of Conduct to the Dean of Students.

### **Disabilities**

If you feel that you may have a disability that requires accommodation, contact the Disabled Student Services Office at 747-5184, go to Room 106E UnionEast, or email [dss@utep.edu](mailto:dss@utep.edu)

### **Assignments**

Reading and homework assignments will be handed out or announced in class. If you miss a class, it is your responsibility to find out what you missed. You should expect to spend at least seven hours per week outside of class on reading and homework.

## Grading

Your semester grade will be based on a combination of homework and lab assignments, weekly quizzes, lab attendance, exams, and a final exam. The approximate percentages are as follows:

- 15% Research poster and defense
- 30% Research proposal (motivation, literature review, question, method)
- 5% Research proposal defense (final exam)
- 20% Précis (10) and topic
- 30% Two midterms

## Schedule (Subject to change)

8/24/09

The structure of a thesis  
Finding relevant literature  
Writing a précis

8/26/09

Reading and explaining a research paper  
**Due:** précis of assigned paper

8/31/09

Finding and formulating research questions

9/02/09

Finding and formulating research questions  
**Due:** Précis of paper you found

9/07/09

Labor Day, no class

9/09/09

Approaches to good writing for research papers, theses and dissertations

9/14/09

Using a style guide

9/16/09

Writing the literature review section  
**Due:** Question and justification

9/21/09

Research in Theory of Computation (Dr. Kreinovich)  
**Due:** Précis of assigned papers

9/23/09

Midterm 1

9/28/09

Editing a research paper

Review of midterm

9/30/09

Formulating good research questions (2)

10/05/09

Writing the methods section

10/07/09

Research in Software Engineering (Dr. Roach)

**Due:** Précis of assigned papers

**Due:** Literature review section

10/12/09

The relationship between writing and critical thinking

10/14/09

More on writing and critical thinking

**Due:** Edited section

10/19/09

Writing the motivation section; studies with human subjects

10/21/09

Preparing a poster

**Due:** Method section

10/26/09

Ethical issues in research

**Due:** Motivation section

10/28/09

Editing a research paper (2)

11/02/09

Presenting a poster

Review of draft posters

**Due:** Poster (*send by e-mail before class*)

11/04/09

Research in computer systems (Dr. Teller)

**Due:** Précis of assigned papers

11/09/09

How to present a research talk

11/11/09

Midterm 2

11/16/09

How to ask and answer questions

11/18/09

Research in human-computer interaction

**Due:** Précis of assigned papers

11/23/09

Integrating the term paper

**Due:** Slides

11/25/09

Writing grant proposals

**Due:** Research proposal

11/30/09

Practice talks

12/02/09

Course evaluation

Practice talks

Final Exam: Research proposal defense talks

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*[DGN](#), November 15, 2009*