11-780 Research Design and Writing

Instructor
Dr. Carolyn P. Rosé (cprose@cs.cmu.edu)

Office hours: Students are encouraged to request meetings with the instructor as needed

Course Drupal: http://kanagawa.lti.cs.cmu.edu/11780/

Units: 12 (PhD/Master’s)
Readings and On-Line Discussions: Readings will be linked to the syllabus or passed out in class. Students are expected to do the homework listed under each lecture in between that lecture and the next one. Readings will be posted to the Syllabus page in the course Drupal. Each student will have their own thread in the Drupal that they will post assignments and commentary to. Additionally, when peer reviews are assigned, students will post to the thread of the student they are critiquing. Posts to Drupal will occur approximately once a week.

Prerequisites: none

Class Meets: T, Th 10:30am-11:50am in GHC 4101

Course Description

In an increasingly competitive research community within a rapidly changing world, it is essential that we formulate research agendas that are of enduring importance, with clean research designs that lead to generalizable knowledge, and with high likelihood of yielding results that will have impact in the world. However, even the best research, if not communicated well, will fail to earn the recognition that it deserves. Even more seriously, the most promising research agendas, if not argued in a convincing and clear manner, will fail to secure the funding that would give them the chance to produce those important results.

Thus, in order to complement the strong content-focused curriculum, we are offering this professional skills course that targets the research and writing methodology that are needed in order to excel in the research community, both during your career preparation at CMU and in your career beyond.

This course focuses specifically on general experimental design methodology and corresponding writing and reporting skills. More than that, this course explores the important connections between research design and writing. The broader social and political context in which research is situated and must respond to and interact with is also explored.

Course Procedures and Grading Criteria

Grades will be based primarily on a series of writing and presentation assignments in which students will apply principles from experimental design methodology. There will also be in-class activities to offer students opportunities to apply and practice their skills. A take-home final exam will test skills and
concepts related to experimental design methodology, and will include short answer questions and a critique of a research paper.

This is meant to be a hands on and intensely interactive course rather than a heavy reading and lecture course. There will be some readings from a variety of sources throughout the semester that will be provided through the course Drupal account. The bulk of the work outside of class will be devoted to a significant writing project of the student’s own choosing. For example, a student may choose to work towards a conference paper about on-going research, a significant literature survey, or a dissertation proposal. There will be seven specific assignments throughout the semester, but most of these will be related specifically to the student’s own project. In each case, students will have 1 week to complete the assignment. Once posted, students will be assigned to peer review another student’s assignment. Additionally, each assignment will get detailed feedback from me. Assignments, critiques, and feedback will be posted to each student’s thread in the course drupal.

Additionally, at least once during the semester each student will give a 5 minute “project report” about their in progress course project and a more substantial presentation about their project at the end of the semester. Students may choose to do this more than once if they find it helpful to do so.

Class participation (10%)
Assignments (50%)
Peer review (15%)
Communication Competition (5%)
Project (10%)
Final critique (10%)

**Semester Schedule**
Note that some readings are left unspecified because they will be selected according to the interests of the students in the class.

**Introduction**

**Week 1 lect 1** Course Introduction
Homework Readings: Informal readings on choosing a dissertation topic, Self-assessment document “Assignment 0”: Log into Drupal and post your writing goal for the semester to your personal course discussion thread. Email me a sample of your writing.

**Formulating your Grand Vision**

**Week 1 lect 2** Assignment 1 assigned [Formulating a Research Question/Plotting a Course towards Graduation – Includes write up and presentation to be given in Week 2 Lecture 2]

Week 2 lect 2 Assignment 1 critique assigned, in class presentations given
Homework Readings: ACM Policy on Plagiarism, Definitions of Plagiarism, Slide deck related to research ethics from Dave Touretzky

Conducting a Literature Review
Week 3 lect 1

Week 3 lect 2 Assignment 2 assigned [Writing a literature review]
Homework Readings: TBA example survey article

Week 4 lect 1
Homework Readings: 2 TBA articles with example literature reviews to critique in class

Week 4 lect 2 Assignment 2 critique assigned

Formulating a Hypothesis
Week 5 lect 1
Homework Readings: TBA article

Week 5 lect 2 Assignment 3 assigned [Formulating a Hypothesis – includes both write up and preparation of a presentation to be given in class in Week 6 Lect 2]
Homework Readings: TBA dissertation readings part 1 [examining the process of preliminary work leading up to a dissertation proposal]

Week 6 lect 1
Homework Readings: dissertation readings part 2

Week 6 lect 2 Assignment 3 critique assigned, student presentations given
**Justifying Methodology**

**Week 7 lect 1**
Examine templates for Intrinsic versus Extrinsic evaluation write ups

**Week 7 lect 2** Assignment 4 assigned [Writing an experimental design/justifying methodology – includes both write up and preparation of a presentation to be given in Week 8 Lect 2]

**Week 8 lect 1**

**Week 8 lect 2** Guest Lecture/ Assignment 4 critique assigned, student presentations given

**Writing a Convincing Data Analysis**

**Week 9 lect 1**
Homework Readings: Minitab User’s manual

**Week 9 lect 2** Assignment 5 assigned [Writing up quantitative data analysis]

**Week 10 lect 1**

**Week 10 lect 2** Assignment 5 critique assigned
Homework Readings: TBA article with exemplary quantitative analysis

**Week 11 lect 1**

**Week 11 lect 2** Assignment 6 assigned [Writing up qualitative data analysis]
Homework Readings: TBA article with exemplary qualitative analysis

**Week 12 lect 1**
Homework Readings: TBA article with exemplary usage of mixed methods
**Week 12 lect 2** Assignment 6 critique assigned  
Homework Readings: TBA example proposal

**Revisiting your Grand Vision: Formulating Next Steps**  
**Week 13 lect 1**  
Homework Readings: TBA concluding chapter of a dissertation

**Week 13 lect 2** Thanksgiving holiday!

**Week 14 lect 1** Assignment 7 assigned [Writing up next steps]  
Homework Readings: TBA concluding chapter of a dissertation

**Week 14 lect 2**  
Homework Readings: TBA collection of “general audience” readings

**Communicating with a General Audience**  
**Week 15 lect 1** Assignment 7 critique assigned  
Homework Readings: TBA

**Week 15 lect 2** Guest Lecture

Final project due by December 18