### Spring 2016 Research Training Course Offerings (xx-198)

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SPRING 2016 COURSE DESCRIPTIONS

36-198, Research Training in Statistics, 9 units
Section TBA, Professor Peter Freeman
Contact by email: pfreeman@cmu.edu and include information about your interest in this project
Exploring Astrostatistics: Analyzing Astronomical Data with Cutting-Edge Methods of Statistics and Machine Learning
As recently as 25 years ago, astronomy was a data-starved discipline, with catalogs that consisted of details about hundreds of objects. Because of the success of projects such as the Sloan Digital Sky Survey, that number has grown from hundreds to hundreds of millions. To make sense of these data, one needs to utilize advanced methods of statistics and machine learning. In this research training course, students will learn how to utilize advanced methods of classification and regression and will apply them to given astronomical datasets. All analyses will be done using the statistical package R. No prior knowledge of astronomy (or of R or of basic data analysis algorithms) is required.

3 students maximum

79-198, Research Training in History, 9 units
Section C., Prof. Christopher Phillips
Contact by email: cjp1@cmu.edu, and include information about your interest in this project and why you think you’d be a good fit.
Clinical Trials and Medical Statistics
Going to the doctor in the twenty-first century is a numerical experience: height, weight, blood pressure, and cholesterol level, to be sure, but also genetic risk analysis, five-year survival rates, and false positive ratios. While statistics have long been a part of epidemiology and public health, the field's role in clinical medicine was largely established in the twentieth century. As part of an ongoing book project on the rise of statistics in medicine, this course will involve uncovering how and why the clinic has been quantified, and what is at stake for those involved. Together we'll gather resources and studies, build a database, and identify important historical events and transitions—all with the hope of uncovering the people and historical contingencies behind the quantification of medicine.

Open to 1-2 students.

82-198, Research Training in Modern Languages
Section A, Prof. Felipe Gomez
Hispanic Comics
Contact by email: fgomez@andrew.cmu.edu, and include information about your interest in this project. This project involves research of Spanish-language comics. The course will teach research, critical reading, and thinking skills useful to students of all majors. Student researchers will assist in: a) identifying, locating, and reviewing major examples of comics from the Hispanic world; b) identifying and selecting canonic and recent theoretical and critical readings about the comic genre in the Hispanic world to contribute to a literature review; c) analyzing and categorizing comics according to given criteria.
Some of the texts are originally written in English or are available in translation, but most are in Spanish. Possible long-term results of this project include a course of study built around this research, and perhaps a published work (for which student participants would be acknowledged as contributors).

Open to one or two students with at least advanced intermediate level reading skills in Spanish.
Using Data to Explore Online Learning
Research for this course will involve three parts: 1. Examining data from student interviews and recordings of their work during an online French course; 2. Improving the interview protocol from fall 2014 based on research and that experience; 3. Carrying out more interviews based on an improved protocol and information from the fall 2014 data. Students need no knowledge of statistics or French for this course.

Cross-Cultural Currents between Spain and the Americas: The Case of Chocolate
This project involves examination of 17th and 18th century treatises in Spanish that document the uses and consumption of chocolate in Spain and the Americas. Students will assist in researching the evolution and reception of these works and their adaptations.

Open to one or two students with at least advanced intermediate level reading knowledge of Spanish.

Concept Formation in Second Language Learning
Second language learning entails much more than the acquisition of new linguistic forms (vocabulary, grammar) for communication. New concepts—or categories of meaning—must also be developed. Categories of meaning are culture specific, and so it is not always possible to map such meanings from one’s first language/culture onto a new language/culture.

In this course, students will assist in analyzing data from a research study that involved an artificial language. The point of the study was twofold. First, it aimed to explore the contribution of several background variables on participants’ ability to deduce meaning from language examples. Second, it aimed to compare the effect of rule-based vs. concept-based explanations of the language. Data to be analyzed include multiple choice responses and open-ended explanations of participants’ understanding of the meaning of the language forms presented in the study at three times: 1) a pretest; 2) an immediate posttest; and 3) a delayed posttest.

Open to more than one student.

Digital Vienna 1900
This is an interdisciplinary project that researches the richness of Viennese culture around 1900 and its ramifications for contemporary Viennese society. The late 19th and early 20th century has to be viewed as a period of extraordinary artistic productivity, scientific discoveries, philosophical and literary movements, and stunning innovations in the realm of urban planning and architecture that clashed with conservative politics, an ossified monarchy, and a bourgeoisie characterized by its rigid code of behavior and a reluctance to change. Yet, despite a society wed to outdated customs and traditions, the arts thrived in
unprecedented ways, thus challenging established norms with 12-tone music, art nouveau (Jugendstil), psychologically driven narratives, and nude art – until it all came to a sudden end with the onset of the First World War.

I am seeking student collaboration for an interdisciplinary course that is intended to showcase Viennese culture in an innovative, digital way. We will do research on the academic content and create a number of exercises and learning tools that will aid in the assessment of students’ comprehension of the covered materials and the evaluation of the benefit of the new digital, interactive interface.

Open to more than one student (knowledge of German preferred but open to other students as well).

85-198, Section A, Research Training in Psychology
Section A, Professor Vicki Helgeson
Contact by email: vh2e@andrew.cmu.edu

Psychology of Gender
Students will be introduced to the field of the psychology of gender with a specific focus on stereotyping, how people respond to men and women who behave in ways inconsistent with sex stereotypes, and the intersection of gender and race stereotypes. Students will read articles on these topics and have hands-on experience conducting research on these topics.

Open up to 5 students

85-198, Research Training in Psychology
Section C, Professor Michael Scheier
Contact: Maria G Mens, mmens@andrew.cmu.edu or Mike Scheier (scheier@cmu.edu)

Personality Psychology
This course provides students with research experience in the area of personality psychology. Our lab focuses on investigating how individuals manage their goal pursuits, with an emphasis on management of goals during serious illness. Students will have the opportunity to be involved in a longitudinal project with a sample of breast cancer patients, and various laboratory experiments. In laboratory projects, students will gain experience working as an experimenter, scheduling and running participants, collecting data, and managing/analyzing this data. In longitudinal projects, students will gain experience in coding qualitative data and analyzing this data. Lab meetings will also help students improve their ability to read and understand research literature, and to think critically about research methodology.

Open to more than one student.

85-198, Research Training: Psychology, 9 units
Section J, Professor Laurie Heller
Contact by email: lauricheller@cmu.edu, and include information about your interest in this project.

Research Training in Auditory Perception
This course provides students with research experience in the area of auditory perception. Students will assist with research projects in the Auditory Perception Laboratory, obtaining hands-on experience with various aspects of conducting research. Students will gain experience in study design, participant recruitment & scheduling, working as an experimenter, data collection, and data management/analysis including acoustic analysis and possibly sound recording and sound synthesis. For example, students may conduct an analysis of the acoustics of sounds which have similar perceptual qualities, or they may run an experiment in which listeners judge the causes of sounds, or listeners may do
tasks seemingly unrelated to the sounds they hear and show evidence of unconscious priming when sounds and words (or gestures) are related.

Students with a special interest in sound synthesis and/or matlab programming should bring attention to that interest.

Open to more than one student.

85-198, Research Training: Psychology, 9 units
Section K, Professor Erik D. Thiessen
Contact: thiessen@andrew.cmu.edu, and include information about your interests in this project.

The Role of Learning in Infants’ Language Acquisition

In order to master their language, infants need to learn an extraordinary amount. They must discover what sounds occur in their language, how those sounds relate to meaning, the identity and meaning of words in their language, and how to string those words together into sentences. Infants are exposed to a rich linguistic environment, but little is known about how infants are able to take advantage of the richness of this environment. In the Infant Language and Learning Lab (http://www.psy.cmu.edu/~thiessen/home.html), we try to understand how infants are able to learn from their environment. In particular, we explore how infants respond to the distribution of probabilistic information across levels of linguistic organization like sound and meaning. To do so, we use a variety of experimental methods, such as habituation, in studies with infants between the ages of 6 and 24 months.

Our experiments present infants with novel languages, and examine what infants are able to learn from them. Specifically, upcoming projects will examine how infants learn that different sounds (like /d/ and /t/) indicate different meanings, how infants discover the rules governing word order in phrases, and how infants learn about the rhythmic structure of their native language.

Open to more than one student.

85-198, Research Training: Psychology, 9 units
Section L, Professor Robert Siegler
Contact by email siegler@cmu.edu and include information about your interest in this course.

The purpose of this course is for undergraduate students to gain experience with research. The course includes working 5-10 hours/week on research being done in our lab, attending research group meetings once/week, and writing a 3-5 page paper at the end of the semester describing what the student learned during the course.

85-198, Research Training: Psychology, 9 units
Section M, Professor Brooke Feeney
Contact by email bfeeney@andrew.cmu.edu, and include information about your interest in this project.

Research Training in Social Psychology
This course provides students with research experience in the area of social psychology. Students will assist with research projects in the Relationships Laboratory, thereby obtaining actual, hands-on experience with various aspects of large research projects on the topic of interpersonal relations. As a member of the Relationships Lab, students will gain experience in study design, participant recruitment & scheduling, working as an experimenter, data collection, and data management/analysis. For example, students may work with newlyweds and dating couples in an experimenter role, code videos of couple interactions, assist with data entry and data analysis, assist with preparation of research reports, and assist with library work.

Open to more than one student.
85-198, Research Training: Psychology, 9 units
Section N, Professor Charles Kemp
Contact: please email ckemp@cmu.edu and include information about your interests in this project.
Understanding Learning and Reasoning
Students will assist with ongoing research projects that explore learning and reasoning. Tasks may include helping to design experiments, schedule and run participants, and analyze data. Many of these experiments are motivated by computational models, and students will have the opportunity to learn about these models if they desire.

85-198, Research Training: Psychology, 9 units
Section O, Professor Michael Tarr
Contact: by email michaeltarr@cmu.edu and include information about your interests in this project.
Students will work on projects involving computational modeling of human visual processing, including the possibility of collecting human behavioral and neural data

88-198, Research Training in Social & Decision Sciences
Section C, Prof. Paul Fischbeck
Description to come.