

## **New Course: Statistical Computer Programming**

I am pleased to announce a new one-credit course in statistical programming, designed primarily with first year graduate students in psychology programs in mind, but open to others. We are experimenting with the course this year because we strongly believe that it will help to address some applied skill deficits identified by students who have progressed into advanced methods courses and dissertation work over the years and by faculty hiring research assistants. Below I provide background information, course content, registration information, and a question and answer section responding to questions that I have already been asked about the new course. If you have additional questions, please send me an email and I will attempt to get back to you by the end of the month: [walls@uri.edu](mailto:walls@uri.edu)

### Background

The MA and PhD programs in Psychology include two required methodology courses, PSY 532 (Experimental Design), and PSY 533 (Multivariate Statistics). Student registration from other departments including business, animal sciences, fisheries, and nutrition, has been rising for several years. With the increase in enrollment, we have divided PSY532 into two sections and attempted to continue offering state of the art computer-based training in programming and modeling during regular lecture sessions. However, the feasibility of enabling students to attain hands-on instruction during lecture sessions is limited in several respects. First, with the increased heterogeneity of course participants, increased time is needed to traverse typical course content. This is made even more challenging by the need to include increasingly diverse approaches to traditional general linear modeling approach, as our fields evolve toward greater specificity in model deployment and advanced modeling courses become essentially a requirement for research and academic track PhD candidates (the majority). Second, in order for our students to serve as productive research assistants, begin publishing earlier in their academic careers, and ultimately be prepared for the task of undertaking analyses for a dissertation, hands-on training in this area is needed.

### Course content

The course will begin with an overview of data entry strategies, such as using Excel sheets, MS Access, or other data entry files from other software packages. Thorough consideration of data cleaning, standardization, and data management will occupy about the first third of the course. The second third of the course will focus on data manipulation, such as merging, concatenating, and splitting data files. The final third will focus on prepackaged statistical procedures in prevailing packages, with a particular focus on ensuring data consistency, plotting and graphing, and some interpretation of results. Customization in the scheduling of content to complement activities in PSY532 and other Fall courses in statistics and anticipated Spring courses will be pursued. The course will not focus on any single computer program, rather, on the fundamental tasks inherent to statistical programming. Examples from SAS, SPSS, R, LISREL, MPLUS, HTML, and SQL will be shared and discussed.

## Specifics

Where: Ballentine 240

When: Thursdays, 4:30-6

Credits: Register for 1 credit

Instructor: Ted Walls

Required texts: None.

Programs required: Option to purchase a student learning edition of SAS. Use of open-source programs, such as R.

## How to register

This course is being taught under an independent study number because it was easier for us to set it up this way for this year. Go to ecampus, and in the Self-Service Student Center choose 'Add a class'. Choose 'Fall 2008'. Search for classes under 'PSY' In the resulting list, scroll to the course number PSY615. Choose Section 0027 for (Theodore Walls). (Be careful to not simply choose Section 0001, which is Al Berman's section number.) Under Course Preferences, select '1' under 'Units' (this means credits).

## Q&A

Q: If I am taking PSY532, do I have to take this course?

A: No, the course is highly recommended for ancillary learning for both sections of PSY532, but it is optional. It has been developed, however, specifically with first year psychology graduate students as the main participants.

Q: If I do not take this course, will I be less able to perform to standard in PSY532?

A: Generally speaking, I am not a big fan of grades in graduate training. If you ask the question "will I learn more so that I will be able to work more effectively in related and later courses and graduate training experiences?" and the answer seems like it is yes, I think you should take this course. It also seems to me that any opportunity to learn more about content related to a course may increase your ability to do well in terms of grades.

Q: I am not a first-year psychology graduate student, rather, I am in a later year of training or I am in a different graduate program at URI. However, I learned about this course and want to improve my statistical programming ability. Can I take this course?

A: Sure, and bring your more advanced and diverse backgrounds with you! The course will not be particularly tied to psychology content, in fact, it may be the least psychology

oriented course in our curriculum. At the same time, it is not a course in pure computer programming; for that you need a course in the computer science department.

Q: I do not really anticipate going into a research career, rather my goals involve clinical practice and or in certain professional placements. Given this, why would I want any more statistical programming than I have to do as part of the required stat sequence?

A: Most of our students take at least one or two methods courses after their first year of required methods courses. First, all of these courses require some independent programming ability. The faculty would like you to be more skilled upon entry into these courses. Second, most research assistant roles involve this kind of work, especially at and after the second year of training. You will be more qualified for these roles. Third, placements in non-research settings increasingly require interaction with web-based, data-driven systems, and artifacts of data analytic professional units. Since some statistical programming generalizes to other programming, you will be better served in any placement with this skill set. Finally, most likely, you will not know which of a clinical, research or professional track will interest you most in five, ten or more years. This skill set is fundamental for any 21<sup>st</sup> century doctoral candidate and it becomes a critical core competency in the job search process.

Q: Can I see a syllabus/what are the requirements?

A: I've tried to provide most of the information for the syllabus here, however, a formal syllabus will be available in the first week of classes. More importantly, I am going somewhat customize this course to student needs from week to week in an effort to make it as useful as possible.

The course will require one relatively short weekly reading and a few simple weekly programming. There will be no tests, however there will be one or two pop quizzes intended to help us all stay together and a simple semester project occupying no more than three hours of preparation will be required. In this project, I will ask you to generate some numbers with one computer program, move them to another program, change them with a statistical program, and move the result back to the first package where you will compare them with your original numbers. There will be some selective readings on topics related to programming and statistics. We will spend most of the time in class working together on programming tasks. Grading will be pass/fail. Attendance will be required with up to three missed sessions allowed.

Q: Wow, I'm worried if I can keep up if I take this course in addition to my required courses....

A: I am aware of this, and although this may occupy a couple more hours per week in the short run, it will help to make you much more efficient in coursework and future work.

Q: I am an undergrad and heard about this course from my advisor. Can I take it for credit?

A: Yes, by permission only and provided you are currently enrolled in PSY300 or have completed PSY300. The course does not fulfill any statistics requirements in the undergraduate general or psychology curriculum.

Q: I am a faculty member and want to send my staff to this course. Can I do this?

A: I am happy to try accommodate these requests on a space available and case by case basis.