**Quantitative Research Methods II: ANOVA**
**16:300:515**
**Spring Semester, 2015**

Instructor:  Gregory Camilli

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Office Hours:  Mondays 2:30 pm. to 4:30 PM *and by appointment.*
        GSE building, Room 325

Meeting Details: Classes will meet Thursdays from 4:50 to 7:30 PM in the computer lab (room) of the Graduate School of Education building.

Prerequisites:
        Statistical Methods in Education I (15:291:531-532)
        Quantitative Research Methods in Education I: Introduction (16:300:511) or the equivalent.

Texts and Materials:
        *Experimental Design & Analysis* (version Dec. 3, 2103) by Howard Seltman (freely available online)

Additional Information:
        Questions during or outside of class are strongly encouraged.
        I may provide additional readings and handouts.
        All reading assignments should be completed by the day indicated in the course outline below.
        I will make PowerPoint slides or other handouts available as the semester progresses.

        I'll use the online tools at sakai.rutgers.edu to make files available to you and to post notices. Please make it a habit to check the site on a regular basis.

Software:
        Microsoft Excel (required)
        SPSS (required)
        Both are available for use in the GSE computer lab (room 208 of the GSE). Alternatively, you can obtain the IBM® SPSS® Statistics Standard GradPack from http://www.studica.com or other online retailers. It's best to get the latest version (V22), but any recent version will suffice. SPSS can also be accessed through apps.rutgers.edu.

Overview:
        This course covers analysis of variance (ANOVA) and related procedures for analyzing experimental, and to a lesser extent observational, data.  Elements of hypothesis testing and study design will also be covered. We'll take an applied approach to the material. As a result, no mathematical knowledge beyond basic algebra and introductory statistics is assumed or required.

Objectives:
1.      To develop the conceptual and statistical knowledge needed to analyze data from experiments.
2.      To understand the assumptions and requirements behind ANOVA.
3.      To learn about threats to internal validity and the means to prevent or limit them through proper design and analysis.
4.      To develop the language and concepts necessary for interpreting and reporting results from experiments.
5.      To gain facility with SPSS software.

Course Outline:

| Class | Date | Chap(s) | Topic(s) | Evaluation |
|---|---|---|---|---|
| 1 | 1/22 | 1,2 | Course introduction; statistics review; experimental design | |
| 2 | 1/29 | 3.1-3.8 | Review of probability | HW1 Assigned |
| 3 | 2/5 | 4,5 | Exploratory data analysis | HW1 Due |
| 4 | 2/12 | 6 | t-tests | |
| 5 | 2/19 | 7 | One-way ANOVA | HW1 Assigned |
| 6 | 2/26 | 8 | Threats to your experiment | HW2 Due |
| 7 | 3/5 | 9 | Simple linear regression | |
| 8 | 3/12 | 10 | Midterm review | |
| | 3/19 | | *Spring Break – No Class* | |
| 9 | 3/26 | 10 | ANCOVA & Multiple regression | HW3 Assigned |
| 10 | 4/2 | 11 | Two-way ANOVA | HW3 Due |
| 11 | 4/9 | 12 | Statistical power | |
| 12 | 4/16 | 13 | Contrasts & custom hypotheses | HW4 Assigned |
| 13 | 4/23 | 14 | Repeated measures | HW4 Due |
| 14 | 4/30 | 16.1-16.2 | Categorical variables | |
| 15 | 5/7 | | Final review | |

GSE 208 Computer Lab Hours:

| | |
|---|---|
| M | 9-4:30 |
| T | 1-2:30 |
| W | 9-4:15 |
| Th | 1-2:30 |
| F | 9-4:30 |

For additional computer labs, go to https://oit-nb.rutgers.edu/labs. Please call OIT to make sure SPSS is available at a particular lab.

Attendance:

Your attendance at class meetings is very important, particularly because we'll meet only once per week. We'll learn quite a bit through in-class exercises, and the homework assignments and exams will reflect this. Please bring any necessary planned absences to my attention ahead of time.

Evaluation:

Your performance in this course will be evaluated based on one in-class exam, one take-home exam, and a series of homework assignments:

| | |
|---|---|
| In-class reviews (tests) | 2/3 |
| Homework assignments | 1/3 |

There will be 5 homework assignments. Homework must be turned in at the beginning of the class meetings (unless specified otherwise) at which they are due in order to receive full credit.

Policy on Academic Integrity:

Please refer to the Policy on Academic Integrity for Undergraduate and Graduate Students at http://teachx.rutgers.edu/integrity/policy.html. I will follow this policy without exception. It is your responsibility to be familiar with the terms of this policy.