Instructor: Liz Sanders  
Email: lizz@uw.edu (email is the best way to communicate)  
Office Hours: Miller 312 #G by appointment (mailbox located to the right of front office)  

Assistant: Elizabeth Holleman  
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Electronic Devices: To form an optimal learning atmosphere for all, laptops/pads/cell phones/recording devices must be turned off/silent and put away during class lectures. E-reader devices/laptops may be used during group article reviews, computer lab, and individual appointments. Audio, not video, recorders may be used with my permission.

Overview: This is a second-level course in statistical methods designed for graduate students in the behavioral and social sciences. Students who take this course are from a diverse array of backgrounds, including education, communications, forestry, linguistics, music, nursing, public health, rehab medicine, psychology, speech and hearing sciences, and technical communications, to name a few! The requirement for this course is that you have completed Edpsy 490 (Basic Educational Statistics) or an introductory univariate statistics course that is equivalent in content (see me if there is any question about previous content coverage). While this course is not mathematically challenging, we assume you are proficient in basic algebra. We will cover three major areas of statistical methods this quarter, including multiple regression, multivariate analysis of variance, and exploratory factor analysis. And, in order to better understand these analytic methods, we will first spend time learning about matrix/linear algebra. The estimated topic and text readings schedule is provided in the table below. Note that there will be many handouts throughout the quarter to supplement text readings. Note that class lectures and discussions are considered part of the course content (this is not designed to be an independent study course where you simply read a text and do assignments): as such, attendance and in-class small group participation is required. If you think you will miss more than two classes, I advise you to drop the course now.

<table>
<thead>
<tr>
<th>Text: Chapter</th>
<th>Tuesdays</th>
<th>Thursdays</th>
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Computer Lab 1 |
Computer Lab 2 |
| | 4/14 – Basics of Linear Regression  
HW1 DUE (introductory) | 4/16 – Basics of Linear Regression  
Computer Lab 3 |
| | 4/21 – Basics of Linear Regression | 4/23 – Basics of Linear Regression |
| | 4/28 – Basics of Linear Regression  
2p: Tina Tian, CSSCR: public datasets | 4/30 – More Linear Regression  
HW2 DUE (linear regression) |
| TB: 7, 9 | 5/05 – More Linear Regression  
PROJ DATA DESCRIPTION DUE | 5/07 – More Linear Regression  
Computer Lab 4 |
| TB: 10 | 5/12 – Logistic Regression  
HW3 DUE (linear/logistic regression) | 5/14 – Logistic Regression |
| | 5/19 – MANOVA & DFA  
HW4 DUE (MANOVA) | 5/21 – MANOVA & DFA |
| TB: 13 | 5/26 – PCA & EFA | 5/28 – PCA & EFA  
PROJECT APPOINTMENTS |
| | 6/02 – NO CLASS (WORK ON PROJECTS)  
project appointments | 6/04 – NO CLASS (WORK ON PROJECTS)  
project appointments |
| | 6/09 – Final Project Due **MILLER 411**  
presentations 1:30-3:50 | 6/11 – HW5 DUE (EFA) LIZ’S BOX, MILLER 312 |

TB = Tabachnick & Fidell, Sixth Ed. (2012)
Text: The required course text is Tabachnick & Fidell’s *Using Multivariate Statistics* (4th, 5th, or 6th Edition). The syllabus chapters assume 6th edition (2012) version, so if you are using an older version please make sure chapters correspond. If you purchased an even older version it will likely still work (again, check that chapters correspond to our topics).

Software: You will need Word, Excel, G*Power, and **SPSS** for assignments; Powerpoint for project presentations. Student versions of all except G*Power are available for purchase at the UW Bookstore or IT Department. **G*Power** is free, downloadable software from: [http://www.gpower.hhu.de/en.html](http://www.gpower.hhu.de/en.html) (just Google it!). Software packages are also installed on computers on the fourth floor of Miller Hall, in the Odegaard library, and CSSCR computer lab (basement of Savery Hall: [http://julius.csscr.washington.edu](http://julius.csscr.washington.edu)). Note: new versions are not always compatible with older versions; be sure to save “down” if you are working between computers. **notes on SPSS versions given on next page**

Computer Lab: I have scheduled computing lab time on Thursdays at CSSCR during the beginning of the quarter. On days that we have lab, we will walk over to Savery 117/121 from our regular class (we will typically leave at 2:50 for 3:00 lab on Thurs for the beginning of the quarter). Labs will coincide with material taught in class; **attendance is required**.

Other Supplies: You will need a memory stick/jump drive to save files during labs, and calculator that can perform a number raised to a power (\(^\) or \(y^X\)), square roots (\(\sqrt{\) and other roots (\(X^{^\sqrt{Y}\) natural logarithms (ln), and exponentiation (\(e^X\) or exp) of a number. The **TI-30Xa SE** and **HP 30S** are both examples of calculators that can perform these functions. A 3-ring binder to keep your notes and handouts in is also strongly recommended for staying organized. In addition to always bringing your calculator to class, I also recommend bringing a few colors of pens/highlighters for taking notes.

Class Email List: I will create a class email list to communicate course announcements and homework sets; be sure that you can receive group emails in your email settings. Note that class emails do not allow anyone to select “reply all” (all queries go to me directly). I will also be setting up small working groups within the first week of class for you to collaborate on in class exercises, article reviews, and homeworks.

Performance Evaluation (Grades): Grades comprise three parts: attendance, homeworks, and a final project. An accumulation of 98% of the total points will receive a decimal grade of 4.0, and an accumulation of 68% of the points will receive a graduate passing grade of 2.7 (note however that 3.0 is the grade generally required of graduate TAs/RAs). The decimal grades between 4.0 and 2.7 are in intervals of 2-3% of the accumulated points.

1. Attendance/Participation (10%)
   Attendance, in concert with readings and assignments, is an important feature of the learning process and is thus given weight in your course grade. In addition to attending class and lab, there will be times in the quarter that I will ask small groups to work together in class, as well as obtain and critique journal articles found at the UW library online. **Absence Make-ups:** If you know you will need to miss class, let me know via email and I will provide a make-up attendance assignment after you return. Note that no make-ups are available for the final project day of class (presentations), and all make-ups must be submitted by the final day of class for credit.

2. Homeworks (75%)
   There will be 5 homeworks that will be emailed to the class in a timely manner that corresponds to topic coverage. You will typically have 1-2 weeks to complete an assignment; the turn-around time will depend on the topic and the amount of work required. You may work in groups for discussing how to tackle problems in the assignments; however, each person is expected to turn in their own original work. Homeworks should be typed in complete sentences for all non-calculation questions, and all necessary SPSS syntax and outputs should be embedded in your write-ups. **Homeworks can be time very consuming** and you may need help with a software glitch or getting feedback: please plan to work on your homework as soon as you get it (most students report 20-30 hours spent per homework, esp. HW2 & 3). **Late Policy:** I accept late homework with a 5% deduction of possible points each calendar day it is late. To receive any credit, late homeworks must be turned in by the last day of class.

3. Final Project (15%)
   There will be one individual project in which each person will answer a specific set of research questions by applying one method learned in this course to a dataset of interest. This can be your own dataset, your advisor’s or work’s dataset (with permission from the P.I.; note that UW human subjects approval is not required for class projects), or a publicly available dataset (some of these datasets can be obtained with help from the CSSCR data archivist Tina Tian, **txtian@uw.edu**). The format of the project is either a short paper (text length of 5-7 pages, double-spaced, APA style) or a 5-minute in-class presentation (with handout, including results tables). In either format, the goal is for you to (a) correctly apply a new method learned in this course to research question(s) that interest you, and (b) correctly communicate your findings. Projects must be turned in on the last day of class for credit consideration. Detailed information about project requirements will be handed out in a few weeks.

Students with Disabilities: If you require accommodations for a disability, you will need to contact Disabled Student Services (206) 543-8924 (VT/TTY) to create a plan and obtain a letter detailing the plan. Bring the letter to me and we will make time to privately discuss arrangements for accommodations.
Supplementary Resources (Not Required)

**APA Formatting**
- [Purdue University's Online Writing Lab (OWL) for APA Style](https://owl.english.purdue.edu/owl/resource/560/01/)

**Multiple Regression (univariate methods)**

**MANOVA, DFA, PCA, & EFA (multivariate methods)**

**SPSS software (using it for the first time)**
- Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics.* Sage Publications. **Many students love this book if they are new to SPSS**

**Notes on SPSS Software Versions for UW Students, Especially Mac Users**

SPSS has been around for a long time. For a short period it was known as “PASW” but it is now back to its original name. I am sharing information from the UW's IT department regarding issues related to SPSS installation/use, especially for **Mac** users. SPSS was never created with Mac operating systems in mind, and it has had a hard time keeping up with all the different Mac platforms. If possible, I recommend you get the "disk" version of SPSS. It costs a few dollars more, but it may save you some tears of frustration. If none of these work for you, use the versions that are physically available on campus (like CSSCR, fourth floor of Miller, or the libraries).

**VERSIONS AVAILABLE FROM UW BOOKSTORE & UW IT (NOT ALL VERSIONS AVAILABLE)**
- **SPSS 19** perpetual license (forever software!!) = $126 downloadable or $140 bookstore disc copy; website: [http://www.washington.edu/itconnect/wares/uware/spss-19-perpetual-license/](http://www.washington.edu/itconnect/wares/uware/spss-19-perpetual-license/) (version 19 is cheaper because it does not include any "fancier" statistical methods; this is OK because "fancier" methods generally are conducted on specialized software (when you take those classes))
- **SPSS 21** annual license (must be renewed every year July 1) = $171.60 downloadable ONLY: [http://www.washington.edu/itconnect/wares/uware/spss-21-annual-subscription/](http://www.washington.edu/itconnect/wares/uware/spss-22-annual-subscription/)
- **SPSS 22** annual license (must be renewed every year July 1) = $178.75 downloadable or $194 bookstore disc copy: [http://www.washington.edu/itconnect/wares/uware/spss-22-annual-subscription/](http://www.washington.edu/itconnect/wares/uware/spss-22-annual-subscription/)

**PC USERS: Versions available through IBM**
- **SPSS 19 through 22** is supported on Windows 7 and Windows 8
- **SPSS 18** is supported on Windows 7 or lower (unknown if it supported on Windows 8 or newer)

**MAC USERS: Versions available through IBM (IMPORTANT TO READ BEFORE ANY PURCHASE)**
- **SPSS 18 & 19 (only version 19 available from UW)** releases supported on Apple Mac OS 10.5 (Leopard) and 10.6 (Snow Leopard) with Intel processor. NOT supported on Mac OS 10.7 (Lion) and later.
- **SPSS 20** (not available from the UW) supported on Apple Mac OS X 10.6 (Snow Leopard) & 10.7 (Lion) with Intel processor.
- SPSS 20 was developed and released prior to Apple's release of 10.8 (Mountain Lion) operating system. It is not supported on 10.8, meaning any issues found can only be addressed in future releases. However, no serious issues are anticipated, and SPSS 20 can run on Mountain Lion with Intel processor but: (1) for new installations of 20 it is strongly recommended to read Technote 1606447 first and follow the instructions about Apple's new Gatekeeper security feature, and (2) if you are upgrading the operating system around an existing installation of 20.0, you may experience issue with your license code. See Technote 1607184 for info.
- **SPSS 21** supported on Apple Mac OS X 10.6 (Snow Leopard), 10.7 (Lion), & 10.8 (Mountain Lion) with Intel processor.
- **SPSS 22** supported on Apple Mac OS X 10.7 (Lion) & 10.8 (Mountain Lion) with Intel processor. SPSS 22 NOT supported for Apple Mac OS X 10.6 (Snow Leopard). SPSS 22 was developed and released prior to Apple's release of OS X 10.9 (Mavericks). Per SPSS Product Management, version 22 can be installed on Mac OSX 10.9 **if you install Apple Java SE 6 (1.6.0_65) on OS X 10.9 first** installing 22. See [http://support.apple.com/kb/dl1572](http://support.apple.com/kb/dl1572) for download.
- For more information, see the IBM's website: [https://www-304.ibm.com/support/docview.wss?uid=swg21507587](https://www-304.ibm.com/support/docview.wss?uid=swg21507587)

**RESOURCES WHEN THINGS AREN'T WORKING**
- IBM product support/documentation if you got a disk version (see the product packaging for IBM's online support documentation)
- UW IT department if you did a download version of the software ([help@uw.edu](mailto:help@uw.edu))
- CSSCR staff (computer lab) (consulting hours posted on: [http://julius.csscr.washington.edu/](http://julius.csscr.washington.edu/))