# SOCI 611: The General Linear Model

The University of Calgary, Faculty of Arts, Department of Sociology
Course Outline, Fall Semester, 2013

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| **Instructor:** <br> Alex Bierman, Ph.D. <br> **Office:** SS 902 <br> **Phone**: 403-220-6226 <br> **E-mail:** aebierma@ucalgary.ca <br> ***E-mail is the best way to reach me.*** <br> <br> **Office Hours:** Wednesdays, noon to 1:30 pm, or by appointment. <br> <br> **Teaching Assistant:** <br> Kristen Desjarlais-de Klerk <br> **E-mail:** kdesjarl@ucalgary.ca | **Lecture Schedule**: 9:00 am - 11:50 am, Wednesdays, SS 921. <br> <br> **Lab Schedule**: 9:00 am - 11:50 am, Fridays Social Sciences computer lab. The lab will be reserved for the class from 8:30 am. <br> <br> **Final:** 9:00 am, Friday, December 13th, 2013 in SS 921. |

## Required Text

McClendon, McKee, J. 2002. Multiple Regression and Causal Analysis. Prospect Heights, IL: Waveland Press.

**NOTE:** There will also be several additional readings assigned. Usually, these papers will be available for downloading through the university library. In the event that this is not the case, two to three copies of these readings will be made available in the main office on a **two-hour loan basis.**

## Recommended Text

Longest, Kyle C. 2012. *Using Stata for Quantitative Analysis*. Thousand Oaks, CA: Sage.
- Unless you have extensive experience with Stata, consider this text ***very strongly*** recommended.

Allison, Paul A. 1999. *Multiple Regression: A Primer*. Thousand Oaks, CA: Pine Forge Press.
- One chapter from this text will be required and made available for photocopying for students who did not purchase the text.

## Course Description and Objectives
This course covers the fundamentals of multiple regression, with a focus on the ordinary least squares (OLS) regression model. It also includes an introduction to more complex linear regression models, including models with limited dependent variables (e.g. logistic regression) and maximum likelihood estimation. Relevance for sociological research is discussed through examples drawn from the literature and the professor's own research. The course also includes a laboratory component where students will have opportunities to apply the techniques learned in class. The software Stata is used for the laboratory component of the course; Mplus may also be used. This course is intended to provide students with the statistical skills to (1) successfully complete a quantitative Master's thesis, (2) understand and critique the wider sociological literature, (3) be prepared for more advanced courses (including SOCI 711).

## Prerequisites
SOCI 311 and SOCI 315 or equivalent

## Staying in Contact
Class announcements may occasionally be sent out over e-mail. It is your responsibility to ensure that the university has your correct e-mail address and that your e-mail account is in working order. Outside of office hours or pre-scheduled appointments, the best way to reach us is through e-mail. We cannot guarantee that phone calls will be answered or returned. When e-mailing, please put "SOCI 611" in the subject line of your e-mail to help us reply more efficiently to your e-mails. We will make every effort to reply to your e-mails within 24 hours. Typically, e-mail should be used to make appointments or ask for clarifications regarding class scheduling, etc. Previous experience shows that possibility of misunderstanding is quite high when e-mail is used to answer questions about statistics, so it is better to deal with substantive matters in-person.

## Grading System

| A+  = 95 and over | B+ = 80-84 | C+ = 67-71 | D+ = 54-58 |
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| A  = 90-94 | B  = 76-79 | C  = 63-66 | D  = 50-53 |
| A- = 85-89 | B- = 72-75 | C- = 59-62 | F  = 49 and lower |

Please note that a grade of A indicates excellent performance, and therefore indicates a comprehensive and thorough grasp of the material. A grade of B indicates a strong grasp of the material. I reserve the right to use the full scale of grades available.

## Grade Distribution
Lab                                                             30%
Exam 1                                                          35%
Exam 2                                                          35%

## Course Format

The course setup consists of one two-hour and fifty-minute lecture, along with one two-hour and fifty-minute lab. It is entirely possible that lab time may be devoted to lecturing by either the instructor or the T.A. You will be expected to know any material presented in labs for exams. This includes knowing how to use Stata and Stata-based syntax, as well as knowing how to interpret output from Stata. Knowledge of Mplus syntax and output may also be required.

## Lab Fee

Please note that a $15.00 lab fee is a part of this class. This fee is payable (in cash) to your T.A. This fee will cover printing **during lab**. We have been instructed that this fee will not cover printing fees outside of lab hours, even if printing is done in the lab, and even if printing is done immediately following lab.

## Raising Your Hand

Graduate classes are often conducted in a seminar format, which tends to facilitate a more informal style of class discussion. I highly support this. However, this approach is less conducive to learning in statistics. In my own experience, stopping in the middle of explaining a concept often confuses others who are trying to grasp this concept. Also, I frequently find that questions are answered as I explain the concept. Because of this, I ask that you raise your hand in class and wait to be called on. Please note that I strongly encourage you to ask questions during class, and even question me if you do not believe that a point that I am making is correct. I just ask that you raise your hand and wait to be called on. Please also note that I will often call on students immediately when a hand is raised.

## Labs and Exams

Lab is your opportunity to learn to apply the concepts discussed in class to real-world data. For lab exercises, the class will work from a large probability sample of residents from the U.S., the MIDUS. Because of the importance of labs for understanding how to apply statistics for real-world problems, the TA will be directed to grade the labs quite strenuously.

All lab assignments will be due on the Friday following lab. Policies for allowing late/deferred labs are the same as those for allowing deferred exams. Note that you may not be able to complete assignments during the time allotted for the Friday lab, which may require you to devote additional time to the assignments outside of lab.

Exams will be conducted in a classroom, rather than the lab. Although you may be asked questions that involve Stata (or Mplus) output or syntax, you will not need to use statistical software for the exams. All exams will be open note and open text. Please note that this will allow me to ask fairly in-depth questions. In other words, you won't be able to simply start going through your notes and text at the time of the exam and do well in this class. Please note that the schedule in this course outline is tentative, including the date and time of the exams. It is your responsibility to be aware of when an exam will be given.

Course Notes:

1. The main Sociology Department office does not deal with any course-related matters. Please speak directly to your instructor.
2. Academic Misconduct: Please refer to the website listed below for information on University of Calgary policies on Plagiarism/Cheating/Other Academic Misconduct:
   http://www.ucalgary.ca/pubs/calendar/current/k-2-1.html
3. Protection of Privacy: The Freedom of Information and Protection of Privacy (FOIPP) legislation does not allow students to retrieve any course material from public places. Anything that requires handing back will be returned directly during class or office hours. "If students are unable to pick up their assignments from the instructor, they provide the instructor with a stamped, self-addressed envelope to be used for the return of the assignment."
4. Ethical Research: Students are advised that any research with human subjects--including any interviewing (even with friends and family), opinion polling, or unobtrusive observation--must have the approval of the Departmental Ethics Committee. In completing course requirements, students must not undertake any human subjects research without discussing their plans with the instructor, to determine if ethics approval is required.
5. Deferrals: If possible, please provide advance notice to the instructor if you are unable to write an exam or complete/turn-in assignments on time. All requests for deferral of a course component due to health reasons must be accompanied by written documentation as outlined in the University Calendar and should be obtained while the student has the health issue rather than after recovery. Deferrals will be allowed in the following circumstances: illness, domestic affliction or religious conviction. Travel arrangements and misreading of the syllabus are not valid reasons for requesting a deferral. Deferrals will not be granted if it is determined that just cause is not shown by the student. If you have missed a test for a legitimate reason, the instructor can require you to write a "make up" test as close in time to the original test as possible or can choose to transfer the percentage weight to another course component. If the instructor schedules a "make up" test for you, its date and location will be at the convenience of the Department of Sociology. Deferred Final Exam Form: Please note that requests to defer a Registrar scheduled final exam are dealt with through the Registrar's Office. Further information about deadlines, and where paperwork should be taken, is available on the form, which can be found at:
   http://www.ucalgary.ca/registrar/files/registrar/Sp_Su_DFE_App.pdf
   Deferred Term Work Form: Deferral of term work past the end of a term also requires a form to be filled out. It's available at http://www.ucalgary.ca/registrar/files/registrar/defTW.pdf
   Once an extension date has been agreed between instructor and student, the form should be taken to the Faculty of Arts Program Information Centre (SS 110) for approval by an Associate Dean (Students).
6. Student Representation: The 2013-14 Students' Union VP Academic is Emily Macphail; email: suvpaca@ucalgary.ca. The Faculty of Arts has four SU representatives who may be contacted at any of the following email addresses: arts1@ucalgary.ca, arts2@ucalgary.ca, arts3@ucalgary.ca, and arts4@ucalgary.ca. You may also wish to contact the Student Ombudsperson for help with a variety of University-related matters: http://www.ucalgary.ca/provost/students/ombuds/role
7. Emergency Evacuation: In the case of fire or other emergency evacuation of this classroom, please proceed to the assembly point at Education Block - Food Court. Please check these assembly point locations for your other classes at:
   http://www.ucalgary.ca/emergencyplan/assemblypoints
8. Safewalk: The University of Calgary provides a "safe walk" service to any location on Campus, including the LRT, parking lots, bus zones, and campus housing. For Campus Security/Safewalk call 220-5333. Campus Security can also be contacted from any of the "Help" phones located around Campus.
9. Academic Accommodation: Students with a disability, who require academic accommodation, must register with the Disability Resource Centre (MC 293, phone 403-220-8237). Please provide academic accommodation letters to the instructor as early in the semester as possible and no later than two weeks after the course begins.

# Tentative Course Schedule

*Please also note that this schedule is indeed <u>tentative</u>.*  Given the pace of the class, I may choose to change the time spent on some subject matter, add some topics, or delete others.  I will try to do my best to maintain the dates on which exams are given and papers due, but these may change as well.  Please note that unless otherwise stated, a lab will be held on the Friday following lecture.

| Week | Lecture Date | Topic/Material |
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| 1 | Sep. 11 | **READ THE COURSE OUTLINE!!!** <br> A review of undergraduate statistics |
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| 2 | Sep. 18 | Bivariate regression:  McClendon chapters 1 & 2; Allison chapter 5. |
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| 3 | Sep. 25 | Multiple regression:  Begin hypothesis testing in regression. McClendon chapter 3; Allison chapters 1 and 2. |
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| 4 | October 2 | Finish hypothesis testing and begin assumptions/model diagnostics: McClendon chapter 4 (briefly mentioned in Allison chapter 5); Allison chapter 7.  Ellison and Fan (2010). |
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| 5 | Oct. 9 | Finish assumptions/model diagnostics:  Allison chapter 6 |
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| 6 | Oct. 16 | **Open review for EXAM 1, which will be held during lab on Friday in SS921** |
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| 7 | Oct. 23 | Dummy variables and non-linear relationships:  McClendon chapters 5 & 6; Allison chapter 8, pages 153-166.  Baker and Draper (2010). |
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| 8 | Oct. 30 | Logistic regression.  We will have an additional reading on this topic. |
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| 9 | Nov. 6 | Begin mediation:  MacKinnon et al. (2007); Preacher and Hayes (2004). |
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| 10 | Nov. 13 | Finish mediation, begin moderation:  McClendon chapter 7; Allison chapter 8, 166-end. |
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| 11 | Nov. 20 | Moderation.  Empirical reading by Schieman and Pearlin (2006) |
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| 12 | Nov. 27 | Finish moderation.  Empirical reading by Bierman (2013) |
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| 13 | Dec. 4 | TBD.  May include:  Missing data analysis, Weighting, Principal components analysis, Cronbach's alpha.  We will have an additional reading. <br><br> **FINAL IN SS 921, 9:00 AM, ON FRIDAY, DEC. 13TH.** |