Instructor: Dr. Zhiqiu Lin  
Office: Loeb Building, D792  
E-mail: Zhiqiu_lin@carleton.ca

Class Times: 11:35am - 1:30 Fridays  
Location: RB3320

Computer Lab Time: 1:30-2:25 pm Fridays  
Location: 3320 RB

Office Hours: 10 am -11 am, Fridays or by appointment,  
Location: Room Loeb D792

Please note that our first class is on January 11, 2019; the last class on April 5th; there is no class on February 22th during the reading week.

Prerequisites: SOCI 3000 and third-year standing

Course Description  
This is a second-level introductory course on the analysis of quantitative data. Its focuses will be on inferential statistics, and bivariate and multiple regression analysis. Students will learn the material through lectures, readings, problem solving and participation in computer laboratory sessions. In each class, there are normally a two-hour lecture and a one-hour computer lab or tutorial. A major objective of the computer labs is to give each student "hands-on" computer experience in analyzing sociological data using the Statistical Package for the Social Sciences (SPSS). Students should be able to deal with the material in this course if they attend all lectures and labs, approach the readings systematically, and are sure to ask questions on any points that puzzle them.

Student Evaluation  
(1) Assignments:  
(a) There will be three assignments. Each assignment will involve some calculation by hand and by computer using SPSS. Please note that the students must retain a hard copy of each assignment that is submitted.

(b) Value of the Assignments: Due Date
Assignment #1 Value: 15%; Feb. 8th, 2019, in class;
Assignment #2 Value: 15%; Mar. 8th, 2019 in class;
Assignment #3 Value: 15%; March 29th, 2019 in class;

(c) Total value: 45%.

(2) **First Mid-Term Examination**
(a) Time: Feb. 15th, 2019
(b) Duration: 2 hours
(c) Content: All material covered before Feb. 15th, 2019
(d) Value: 25%
(e) Please note that there will be no opportunity to write a missed exam. If the exam is missed, medical documentation is required and the final exam will be weighted as 55% of the total grade.

(4) **Final Examination**
(a) Time: April 5th, 2019
(b) Duration: 2 hours
(c) Content: All material covered after March. 29th
(d) Value: 30%

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<tr>
<th>Evaluation Components</th>
<th>Value</th>
<th>Due Dates</th>
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<tbody>
<tr>
<td>Assignment#1</td>
<td>15%</td>
<td>February 8th, 2019, in class</td>
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<tr>
<td>Assignment#2</td>
<td>15%</td>
<td>March 8, 2019, in class</td>
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<tr>
<td>Assignment#3</td>
<td>15%</td>
<td>March 29th, 2019, in class</td>
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<tr>
<td>Mid-term exam</td>
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<td>February 15th in class</td>
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<tr>
<td>Final examination</td>
<td>30%</td>
<td>April 5th in class</td>
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**Required Texts**


**Important Conventions in This Course**

(1) Except in the cases of documented illness, or extenuating circumstances brought to the attention of the instructor at least one day before the due date of an assignment, there will be a penalty for a late assignment of 10% of the assigned grade per day.
(2) Students who are unable to write the mid-term examination because of illness or other circumstances beyond their control must contact the instructor no later than five working days after the original examination. In this case, medical documentation is required and the final exam will be weighted as 55% of the total grade.

(3) No books or notes may be referred to during the examinations. However, students will receive a list of the relevant statistical formulas directly from the textbook. Your own calculators (not cellular phones) may be used in the examination.

**Tentative Course Schedule**

Note: The following schedule may be revised and some topics may be dropped or added.

**Topic and Readings**

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**Topic 1: Brief Review of Basic Statistical Concepts**

- The mean, variance and the standard deviation (Readings: Healey and Prus’s Chapters 3, pp. 76-103)

**Topic 2: Review of Normal Curve and Normal Distribution** (Readings: Healey and Prus’s chapter 4, pp. 114-131)

**Topic 3: Elementary Probability Theory** (Reading: Class-handouts)

1. Introduction
2. Definition of probability: theoretical and empirical approaches
3. Formal properties of probabilities
   - The additional rules
   - The multiplicative rules

**Topic 4: Introduction to Statistical Inference** (Readings: Healey and Prus’s Chapter 5, 142–144)

1. Random and probability sampling
2. Concept of Sampling Distribution
   1) Introduction
   2) Characteristics of a sampling distribution for the means: the Central Limit Theorem

**Topic 5: Statistical Estimation of Population Parameters** (readings: Healey and Prus’s Chapter 6, 162-187)

1. Introduction
2. To estimate the magnitude of unobserved population parameters from sample statistics: Point estimates and Interval estimates of the means
(3) Interpretation of interval estimate

**Topic 6: Hypothesis Testing I** (Readings: Healey and Prus’s Chapter 7, 195-226; chapter 8, 218-237)

1. Introduction to Hypothesis Testing
   1) General hypothesis
   2) Working hypothesis
   3) Statistical hypothesis: null hypothesis and alternative hypothesis
   4) The process of hypothesis testing

2. T-distribution
3. The two types of errors
4. The testing statistical hypotheses
   1) One sample test for a means
   2) The one-sample test for proportions

**Topic 7: Hypothesis Testing II** (Readings: Healey and Prus’s Chapter 8, 235-256)

1) the two-sample case
   (a) The two-sample test for means
   (b) The two-sample test for proportions

**Topic 8: Hypothesis Testing III** (Readings: Healey and Prus’s Chapter 10, 298-312): Chi-square test

**Topic 9: Simple Regression Analysis** (Reading: Healey and Prus’s Chapter 13, 408-414)

(1) Equation for a regression line
(2) Constructing a regression line
(3) Interpretation of regression equation
(4) The application of regression analysis
(5) Standardized regression equation
(6) Residual variance and standard error of estimate
(7) Assessing explanatory power of regression equation: the R squared
(8) Association and causation
(9) Standardized regression coefficient
(10) Application of Regression Analysis

**Topic 10. Introduction to Multivariate Data Analysis** (Reading: Healey and Prus’s Chapter 14, 4442-479)

1. Multivariate Contingency Table Analysis
2. Multiple Regression Analysis
   - The Concept of Control
- The Meaning of residualization and the Partial Correlation
- Steps of residualization process (optional)

3. Calculating partial correlation
4. Application of Multiple Regression Analysis
   1) Partial regression coefficients
   2) Explained and unexplained variation
   3) F-test of Multiple R Square: testing the regression model.
   4) T-test of regression coefficients: testing for significance of a single regression coefficient.
   5) Differences between f-test and t-test
   6) Confidence intervals around the regression coefficients

**Important Information from Carleton University Calendar**

In accordance with the Carleton University Undergraduate Calendar Regulations, the letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100  B+ = 77-79  C+ = 67-69  D+ = 57-59

A  = 85-89  B  = 73-76  C  = 63-66  D  = 53-56

A -  = 80-84  B -  = 70-72  C -  = 60-62  D -  = 50-52

F  = Below 50  WDN = Withdrawn from the course

DEF = Deferred (See above)

**Academic Regulations, Accommodations, Plagiarism, Etc.**

University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university’s website, here: [www.calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/](http://www.calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/)

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

**Academic Accommodations for Students with Disabilities**

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable).

*The deadline for contacting the Paul Menton Centre regarding accommodation for final exams for the Winter 2019 (April) exam period is **March 15, 2019**.*
For Religious Obligations:
Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: www.carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

For Pregnancy:
Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: www.carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

For Survivors of Sexual Violence
As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: www.carleton.ca/sexual-violence-support

Accommodation for Student Activities
Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf

Plagiarism
Plagiarism is the passing off of someone else's work as your own and is a serious academic offence. For the details of what constitutes plagiarism, the potential penalties and the procedures refer to the section on Instructional Offences in the Undergraduate Calendar. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy (See https://carleton.ca/registrar/academic-integrity/). The Policy is strictly enforced and is binding on all students. Academic dishonesty in any form will not be tolerated. Students who infringe the Policy may be subject to one of several penalties.

What are the Penalties for Plagiarism?
A student found to have plagiarized an assignment may be subject to one of several penalties including but not limited to: a grade of zero, a failure or a reduced grade for the piece of academic work; reduction of final grade in the course; completion of a remediation process; resubmission of academic work; withdrawal from course(s); suspension from a program of study; a letter of reprimand.
What are the Procedures?
All allegations of plagiarism are reported to the faculty of Dean of FASS and Management. Documentation is prepared by instructors and departmental chairs. The Dean writes to the student and the University Ombudsperson about the alleged plagiarism. The Dean reviews the allegation. If it is not resolved at this level then it is referred to a tribunal appointed by the Senate.

Assistance for Students:
Academic and Career Development Services: http://carleton.ca/sacds/
Writing Services: http://www.carleton.ca/csas/writing-services/
Peer Assisted Study Sessions (PASS): https://carleton.ca/csas/group-support/pass/

Important Information:
- Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).
- Students must always retain a hard copy of all work that is submitted.
- Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.
- Carleton University is committed to protecting the privacy of those who study or work here (currently and formerly). To that end, Carleton’s Privacy Office seeks to encourage the implementation of the privacy provisions of Ontario’s Freedom of Information and Protection of Privacy Act (FIPPA) within the university.
- In accordance with FIPPA, please ensure all communication with staff/faculty is via your Carleton email account. To get your Carleton Email you will need to activate your MyCarletonOne account through Carleton Central. Once you have activated your MyCarletonOne account, log into the MyCarleton Portal.
- Please note that you will be able to link your MyCarletonOne account to other non-MyCarletonOne accounts and receive emails from us. However, for us to respond to your emails, we need to see your full name, CU ID, and the email must be written from your valid MyCarletonOne address. Therefore, it would be easier to respond to your inquiries if you would send all email from your connect account. If you do not have or have yet to activate this account, you may wish to do so by visiting https://students.carleton.ca/