

<b>Professor</b>	Dr. Victoria Sytsma victoria.sytsma@queensu.ca
<b>Professor Office Hours</b>	Wednesdays 1 pm to 2 pm Mackintosh-Corry Rm. D523

## Course Outline and Objectives

This course serves as an introduction to a broad range of quantitative methods typically employed in the social sciences in a manner suitable for students at the graduate-level. Students will learn to prepare data for analysis, carry out analyses, and interpret research results using a variety of statistical techniques. Students will be acquainted with the assumptions that are made while employing various methods, as well as the problems that arise with the use of such methods.

## Learning Outcomes

1. Through course readings and lecture you will be the taught theory and arithmetic behind various statistical techniques
2. Through lecture, laboratory assignments, and the empirical paper assignment you will learn about the data analysis process, including applying statistical techniques to answer various types of research questions, testing assumptions of various statistical techniques, data presentation, and interpretation and reporting of results
3. Through lecture, laboratory assignments, and the empirical paper assignment you will be taught how to use SPSS statistical software
4. Through the conference presentation assignment, you will improve public speaking and leadership skills and learn how to prepare and deliver a conference presentation.

## Required Reading

Required readings are listed below and will be posted to OnQ.

## Accessibility Needs

Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact Student Wellness Services (SWS) and register as early as possible. For more information, including important deadlines, please visit the Student Wellness website at: <https://www.queensu.ca/studentwellness/accessibility-services>.

## Academic Integrity

Queen's University treats cases of academic misconduct very seriously. See the School of Graduate Studies and Postdoctoral Affairs webpage on academic integrity for guidelines on avoiding departures from academic integrity and the processes for addressing academic offences (<https://www.queensu.ca/academic-calendar/graduate-studies/academic-integrity-policy/>). If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me. If you have questions about appropriate research and citation methods, please contact me or other available campus resources such as Queen's Learning Commons or Student Academic Success Services.

## Grading:

All components of this course will receive numerical percentage marks. The final grade you receive for the course will be derived by converting your numerical course average to a letter grade according to Queen's Official Grade

Conversion Scale:

*Queen's Official Grade Conversion Scale:*

A+	90-100%	C+	67-69%
A	85-89%	C	63-66%
A-	80-84%	C-	60-62%
B+	77-79%	D+	57-59%
B	73-76%	D	53-56%
B-	70-72%	D-	50-52%
		F	0-49%

<b>Evaluation:</b>	<b>Due Date</b>
Lab #1 (15%)	Oct 5
Lab #2 (20%)	Nov 2
Lab #3 (20%)	Nov 23
Conference presentation (20%)	Nov 30
Empirical Paper (25%)	Dec 7

### Laboratory Assignments

The course consists of 3 lab assignments, which account for 55% of your final grade. The purpose of lab assignments is to apply the concepts and techniques taught in lecture. Lab assignments will be disseminated in class two weeks before the due date and may be completed in pairs to encourage collaboration, cooperation, and collective learning. **All group members must upload a copy of the lab assignment on OnQ before the beginning of class on the due date.**

### Conference Presentation

The course consists of one final term paper as described below. You will be expected to give a 10-minute (excluding audience questions) 'conference-style' presentation prior to submitting your final paper in order to present preliminary results, solicit feedback from colleagues, improve public speaking and leadership skills, and learn how to prepare and deliver a conference presentation. This assignment is worth 20% of your final grade. Students who wish to complete their empirical papers in pairs, will also give their conference presentation in pairs. Presentations will be delivered during the scheduled class time (Friday 8:30 am to 11:30 pm).

### Empirical Paper

The course consists of one final term paper, which accounts for 25% of your final grade. The purpose of the empirical paper assignment is to apply the concepts and techniques taught in lecture. Students will be given access to a dataset and codebook chosen by me. Using the dataset provided and data analysis techniques taught throughout the course, students are expected to develop a research question and develop an 8 to 10-page manuscript (excluding abstract, tables/figures, and appendices where SPSS output will be presented) which empirically answers the research question. The manuscript should include the following:

- Abstract (no more than 100 words)
- Introduction that also serves as a brief literature review (no more than 2 pages)
- Methods section, including analytical framework
- Results section, which must include descriptive statistics, evidence of diagnostic testing (testing assumptions), and a "main analysis"—students are free to choose any hypothesis testing technique from the course for their "main analysis" (i.e. any technique presented after and including chi-square & measures of association)
- Discussion section, including brief description of study limitations (approximate 1 to 2 pages)
- Appendices where interesting but less relevant data tables are presented (optional)
- Appendix which presents relevant SPSS output

All tables and figures must be correctly formatted based on the formatting style shown in class. Software output included in the appendix is NOT a substitute for properly formatted data presentation tables which may or may not be presented in text. The empirical paper may be completed in pairs to encourage collaboration, cooperation, and collective learning. **All group members must upload a copy of the manuscript on OnQ by the due date and time.**

## SPSS

SPSS (formerly known as Statistical Package for the Social Sciences, and briefly known as PAWS [Predictive Analytics SoftWare]) is a statistical analysis software. Many of its functionalities are taught in this course, with the majority of the statistical techniques covered in this course being run electronically, rather than through hand calculations. You are not required to purchase this software, as this software is available at no-charge to faculty, staff and students. Simply log on to your MyQueensU account and select the 'Software Centre' tab. Scroll down until you see download links for SPSS. Choose IBM SPSS Statistics Premium Campus Edition in either versions 26 or 27.

## Requests for Remarking Late Assignments

Late papers will incur a penalty of 5% per day (including weekends) for assignments handed in late (**i.e. after 8:30 am on the day the paper is due**).

## Extensions

To request an extension complete a Request for Academic Consideration for Extenuating Circumstance and submit it to me. Documentation is required for an extension of more than 72 hours. The form can be found here:

<https://www.queensu.ca/grad-postdoc/wellness/accommodations-academic-considerations>

In order to be considered for an academic consideration you **must** follow-up with me to discuss the request and confirm which academic consideration can be granted. **Failure to follow-up with me will result in denial of academic consideration.**

## Requests for Remarking

If you wish to request a remarking of an assignment or test, please submit a detailed memo *in writing* in which you specify the questions or portions of the assignment or test that you believe were marked incorrectly (and why you think the mark was incorrect) within 1 week of the assignment being made available for pick-up.

## Tentative Course Schedule

Date	Topic	Readings
Sept 7	- Introduction; Review of Measurement	
Sept 14	- Frequency Tables; Central Tendency	Weinbach & Grinnell (2015) ch. 2; Haan & Godley (2017) ch. 5; Brunson (2007)
Sept 21	- <b>Guest speakers: Data availability</b> - Measures of Dispersion; Z-Scores; Cross-Tabulation Tables - In-class activity - <b>Lab #1 disseminated</b>	Haan & Godley (2017) ch. 6; Arnold (2014) ch. 11; Lee et al. (2012)
Sept 28	- Hypothesis testing; Probability Samples; Chi-Square; Measures of Association	Haan & Godley (2017) ch. 12; Haan & Godley (2017) ch. 13; Ho et al. (2013)
Oct 5	- T-test - <b>Lab #1 due</b>	Weinbach & Grinnell (2015) ch. 7
Oct 12	- <b>Fall Break (No Class)</b>	
Oct 19	- Correlation - Linear Regression - <b>Lab #2 disseminated</b>	Arnold (2014) ch. 10; Field (2013) ch. 7
Oct 26	- Logistic Regression - In-class activity	Field (2013) ch. 8; Wortley & Owusu-Bempah (2011)
Nov 2	- Ordered Logistic Regression - <b>Lab #2 due</b>	Long (1997) ch. 5; Sytsma & Piza, 2018
Nov 9	- Count models - Discuss Clayton paper - <b>Lab #3 disseminated</b>	Long (1997) ch. 8; Piza (2012); Clayton (2020); Witten (2020)
Nov 16	- <b>Professor away at conference (No class)</b>	
Nov 23	- <b>Lab #3 due</b> - Factor Analysis	DiStafano et al. (2009); Sytsma (2010); George & Mallery (2003)
Nov 30	- <b>Conference presentations</b> - <b>Empirical paper due Dec 7</b>	

### Readings:

Arnold, R. (2014). *Intermediate social statistics: A conceptual and graphic approach*. Oxford.

Brunson, R. (2007). "Police don't like black people": African-American young men's accumulated police experiences. *Criminology & Public Policy*, 6(1), 71-101.

Clayton, A. (2020). How eugenic shaped statistics: Exposing the damned lies of three science pioneers. *Nautilus*, 92. Retrieved from <https://nautil.us/issue/92/frontiers/how-eugenics-shaped-statistics>

DiStefano, C., Zhu, M., & Mindrila, D. (2009). Understanding and using factor scores: Considerations for the applied researchers. *Practical Assessment, Research & Evaluation*, 14(20), 1-11.

Field, A. (2013). *Discovering statistics using IBM SPSS Statistics* (4<sup>th</sup> ed.). Thousand Oaks, CA: Sage.

George, D. & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference* (4th ed.). Boston, MA: Allyn and Bacon.

Haan, M., & Godley, J. (2017). *An Introduction to Statistics for Canadian Social Scientists* (3<sup>rd</sup> ed.). Oxford.

Ho, J.D. et al. (2013). Markers of acidosis and stress in a sprint versus a conducted electrical weapon. *Forensic Science*

*International*, 233, 84-89.

Lee, J.M., Steinberg, L., & Piquero, A.R. (2010). Ethnic identity and attitudes toward the police among African American juvenile offenders. *Journal of Criminal Justice*, 38, 781-789.

Long, J.S. (1997). *Regression models for categorical and limited dependent variables*. Thousand Oaks, CA: Sage.

Piza, E. (2012). *Using poisson and negative binomial regression models to measure the influence of risk on crime incident counts*. Newark, NJ: Rutgers Center on Public Security.

Sytsma, V. (2010). An investigation of the roles of exploratory factor analysis and principal components analysis in the program evaluation literature. Unpublished manuscript.

Sytsma, V., & Piza, E. (2018). Quality over quantity: Assessing the impact of frequent public interaction compared to problem-solving activities on police officer job satisfaction. *Policing: A Journal of Policy and Practice*, 14(2), 526-541.

Weinbach, R.W., & Grinnell, R.M. (2015). *Statistics for social workers* (9th Ed.). Upper Saddle River, NJ: Pearson.

Witten, D. (2020). Response to Aubrey Clayton's "How eugenic shaped statistics: Exposing the damned lies of three science pioneers". *Twitter*.

Wortley, S., & Owusu-Bempah, A. (2011). The usual suspects: Police stop and search practices in Canada. *Policing and Society* 21 (4), 395-407.