Anthropology 3811
Quantitative Methods
FALL 2019

Class Times: Tues & Thurs 10:00 - 11:30 am
Location: RB 3027

Instructor Information

Instructor:	Dr. Jessica Metcalfe
Office Location:	BB 2001 D
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Office Hours:	Tues/Thurs 11:30 am - 12:30 pm, or by appointment

Note: the best way to reach me is by email or by attending my office hours. I do not regularly answer emails on evenings or weekends.

Course Description/Overview

This course is an introduction to understanding and using quantitative data. Some statistical techniques will be discussed, but it is not a statistics course *per se*. Rather, the goal of this course is for students to become comfortable with interpreting and manipulating quantitative data so that they can critically analyze data reported by others and effectively summarize, interpret, and present their own data. Students will work through the process of designing and conducting their own research using quantitative data. Skills developed through this course are not only vital for a career in research but are also transferable to non-academic careers and useful for interpreting information encountered in daily life.

Course Learning Objectives

By the end of this course, students will be able to:

- Interpret quantitative data presented in tables and figures
- Identify appropriate statistical methods and presentation strategies for different types of data
- Collect, analyze, and interpret quantitative data, as demonstrated through their individual research project
- Present quantitative data in a clear and accessible way, as demonstrated by their research poster and in-class mini-conference presentation
- Work collaboratively and provide constructive feedback to peers

Course Website

- Can be used to access lecture slides, quizzes, and other course materials
- Access through Lakehead University website 'Quicklinks' (top right corner), 'For Students > **myCourseLink**

Required Readings:

Textbook – available in the bookstore

Rowntree, Derek (2018). *Statistics without Tears: An Introduction for Non-Mathematicians*. Penguin Books, UK.

PAST 3.25 Manual – free pdf download at https://folk.uio.no/ohammer/past/

Articles – to be posted on course website

Amrhein, V., Valentin, A., Sander, G., Blake, M., (2019). Retire statistical significance. *Nature* 567, 305-307.

Gould, Stephen Jay (1996). Case One: A Personal Story. In *Full House: The Spread of Excellence from Plato to Darwin*. pp. 45-56. New York: Three Rivers Press.

Leek, J., McShane, B.B., Gelman, A., Colquhoun, D., Nuijten, M.B., Goodman, S.N., (2019) Five ways to fix statistics. *Nature* 551, 557-559.

Thomas, David Hurst (1978) The Awful Truth about Statistics in Archaeology. *American Antiquity* 43, 231-244.

Required Materials:

Laptop Computer

Please bring a laptop to each class. If you do not have a laptop, please talk to me ASAP. Laptops are available for borrowing at the university library.

Microsoft Excel

Microsoft Office 365 software is free for LU students – **please download and install it if you do not already have it:** https://www.lakeheadu.ca/faculty-and-staff/departments/services/helpdesk/software/software_available/office-365-for-students

PAST 3.25 Statistical Software (PALeontological STastics)

This free software package is available at https://folk.uio.no/ohammer/past/ Please download both the software and the manual.

Course Grades Breakdown

Item	Value (%)
Class attendance/participation	5
Midterm Exam	15
Final Exam	20
Research Project*	60
TOTAL	**100**

Midterm and Final Exam Format: Both the midterm and final exam will be conducted in a two-stage/group format. In the first (individual) stage, you will complete the exam on your own. Your score on this portion will be worth 85% of your total mark for the exam. After the individual exams are handed in, the class will complete the same exam as a group, submitting one exam for the whole group. This portion is worth 15% of your mark for the exam. If you score higher on the individual exam than on the group exam, only your individual mark will be used (i.e., you cannot lose marks based on the group exam results). The midterm exam will be in-class on Oct. 22. The final exam will be scheduled by the university during the exam period (Dec 5 -15).

Participation: Attendance, engagement, in-class discussions, and activities will all contribute to the participation grade. 'Make-up' options for missed in-class participation will not be provided unless you communicate with me in advance and/or provide appropriate justification (e.g., serious illness, family emergency).

Research Project (Overview): Over the course of this term you will develop a research project that will culminate in a poster presentation during a class mini-conference. The purpose of this project is to develop and practice quantitative research skills, beginning with project design and ending with presentation of results. This will allow you to gain practical expertise in the topics discussed in class. The research will be conducted at Riverside Cemetery. We will non-invasively collect and analyze 'mortuary archaeology' data, by recording information from grave markers. We will develop the research design as a group, but students will collect and analyze data individually. Finally, each student will present their results as a poster at a class mini-conference at the end of term.

The **Research Project** is worth **60% of your final grade** for the course, and is broken down as follows:

Research Project Component	Date(s)	Value (%)
Group planning	Sept 5 – 19	5
Data collection	Sept 19 – Oct 1	10
Poster proposal	Oct 10	10
Poster presentation	Nov 26	25
Peer review	Nov 26	5
Self evaluation	Dec 2	5
TOTAL		**60**

Further details about the research project will be provided on Sept. 5. Considerable amounts of class time will be devoted to developing this project, so please be sure to attend! [If you cannot attend a class, please let the instructor know ahead of time]

Late Assignments will receive deductions of 5% per calendar day (including weekends and holidays). Assignments more than one week (7 days) past a deadline will not be accepted (unless excused in advance by the instructor) and will receive a grade of zero. The exception to this is the poster presentation, which must be handed in and presented in class on Nov 26. If a student misses the class without a valid excluse, they will receive a grade of 0 for their poster.

Tentative Course Schedule (subject to modification)

Classes will combine lectures and laboratory/tutorial activities designed to facilitate learning and develop your research project. As a result, *attendance and active engagement is crucial.*

Please complete the readings before the class to which they are assigned.

Date	Topics	Research Project Development	Readings
Sept 3	Introduction to the course, self assessments		
Sept 5	Quantitative methods: Who? What? Why?	Research project overview	Rowntree pp. 1-13
Sept 10	Sampling	Sampling strategy & ethics	Rowntree pp. 13 - 22
Sept 12	Describing a sample	Selecting and defining variables	Rowntree pp. 23 - 30
Sept 17	**Research Project Site visit - Riverview Cemetery**		
Sept 19	Error, accuracy, and approximations	Operationalizing variables & preparing spreadsheets	Rowntree pp. 30 - 32
Sept 24	Summarizing data: Tables and figures	**Peer evaluations (in class)** Poster proposal introduction	Rowntree pp. 33 – 43
Sept 26	Summarizing data: Central tendency and dispersion		Rowntree pp. 44 - 53
Oct 1	Shapes of distributions	**Data collection assignment due** Developing a research question	Rowntree pp. 54 - 79

Oct 3	Review / Exploratory data analysis		Rowntree ch 4, pp. 69 - 79
Oct 8	Hypothesis testing & selecting a statistical model.	Peer feedback on poster proposal (in class)	Rowntree ch. 6, pp. 102-128
Oct 10	Significance testing Parametric vs non-parametric tests and examples (t-test, Wilcoxon, Mann-Whitney)	**Poster proposal due**	Rowntree ch. 7, pp 129-143
Oct 15 Oct 17	**Fall Study Break No Classes**		
Oct 22	Review	Research posters & conferences	
Oct 24	**Midterm Exam**		
Oct 29	Uses & misuses of statistics in archaeology		Thomas (1978) Leek et al. (2019) Amrhein et a.l (2019)
Oct 31	F-tests for multiple samples: ANOVA, Kruskall-Wallis	Poster presentation requirements	Rowntree ch. 7, pp. 145-152
Nov 5	Chi-Square Tests		Rowntree ch. 7 pp 152-156
Nov 7	Correlation		Rowntree ch. 8, pp. 157 - 179
Nov 12	Regression		Rowntree ch. 8, pp. 179-187
Nov 14	Multivariate analysis		PAST 3.25 manual pp. 97 -100, 104-105, 113-116
Nov 19	To be determined		
Nov 21	Review & the future of statistics		Rowntree pp. 188 - 193
Tues Nov 26	**Class Mini-Conference: Presentation of Research Posters**		
Thurs Nov 28	Final class: Review & wrap-up, exit survey		
Dec 2		Peer & self evaluations due	
Dec 5-15	**Final Exam Period: Exam date to be determined**		

General Information

Students in this course are expected to:

- Attend all classes except in emergency situations, and show up ready to learn
- Be respectful toward the instructor and peers
- Be respectful when conducting research outside the classroom
- Contribute effectively to group work by both speaking and listening carefully
- Take responsibility for their own learngin, but ask for help when needed

Regulations – from the Lakehead University Academic Calendar

"It is the responsibility of each student registered at Lakehead University to be familiar with, and comply with all the terms, requirements, regulations, policies and conditions in the Lakehead University Academic Calendar. This includes, but is not limited to, Academic Program Requirements, Academic Schedule of Dates, University and Faculty/School Policies and Regulations and the Fees and Refund Policies and Schedules."

Plagiarism is defined in University Regulation IX with additional examples in Article I, Section 1 of The Code. Sanctions associated with Academic Misconduct are defined in Article II of The Code and Enforcement Procedures are outlined in Article III of The Code. Students wishing to learn more about Academic Misconduct are encouraged to read the University and relevant Faculty Regulations and The Code (noted above) and access other resources on the Teaching Commons website.

Support for Students – there are many resources available to support our students. These include but are not limited to:

- Health and Wellness
- Student Success Centre
- Student Accessibility Centre
- Library
- Academic Support Zone (Writing and Math Tutoring Centre)

Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities and/or medical conditions 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 Accessibility Services (SAS) and register as early as possible. For more information, please contact Student Accessibility Services http://studentaccessibility.lakeheadu.ca (SC0003, 343-8047 or sas@lakeheadu.ca)