LINB29 Quantitative Methods in Linguistics
Winter 2023
University of Toronto Scarborough

Instructor:	Dr. Curt Anderson (he/him/his)
Class time:	Tuesdays 11:00–14:00
Classroom:	BV 498
Office hours:	W 14:30 to 15:30, R 11:00 to 12:00,
	and by appointment
Course webpage:	Quercus (http://q.utoronto.ca)
Email:	curt.anderson@utoronto.ca

1 Course Overview and Objectives

An introduction to experimental design and statistical analysis for linguists. Topics include both univariate and multivariate approaches to data analysis for acoustic phonetics, speech perception, psycholinguistics, language acquisition, language disorders, and sociolinguistics.

In particular, in this course we'll discuss (to varying degrees):

- The fundamentals of experimental design with emphasis on linguistic research
- Hypothesis testing and issues of population sampling
- Descriptive versus inferential statistics
- Basic statistical methods for different kinds of linguistic data
- How to use the R programming language to analyze data
- Why using quantitative methods in linguistic research is great

2 Relation to Other Courses

Prerequisite:	LINA02H3
Exclusions:	LIN305H, (PLIC65H3), PSYB07H3, STAB23H3
Recommended Preparation:	LINB19H3
Breadth Requirements:	Quantitative Reasoning

3 Readings, Textbook, and Equipment

Textbook: You will have readings from the following textbook. The University of Toronto has access to an electronic copy of this book via the library webpage, and I've put a link to the book on Quercus, so there is no need to purchase it. But, you should download the PDF so that you can easily access it when needed.

- Gries, Stefan Th. 2009. Statistics for Linguistics with R: A Practical Introduction. Berlin: De Gruyter Mouton.

R and RStudio: You will also need to be able to run scripts in the R programming language. The computer labs in BV have R and RStudio installed, and you can log into these computers using your UTORID. On your own computer, you can download RStudio at `https://rstudio.com/products/rstudio/download/#download` (see the link on Quercus). RStudio runs on Windows 7/8/10/11, macOS 10.15+, several popular Linux distributions, and there is also a version that runs in a

web browser. You might also need to download and install R (`https://www.r-project.org/`) separately, depending on your prior system configuration.

4   Requirements

The requirements for this course are as follows:

Assessment	Weight
6 short assignments	13%
3 long assignments	30%
6 in-class quizzes	12%
In-class lab	25%
Final project	20%

Late assignments: In general, late assignments will not be accepted, except under special circumstances. If you anticipate not making a deadline, please talk to me as soon as possible so that we can figure out the next step (such as consulting with AccessAbility Services) to get you back on track in the course.

Grace period: For every assignment, I'll accept it for **24 hours after the official due date with no penalty** (known as the Grace Period). Use this in case of last minute issues with your internet connection, you overslept, you were in a different timezone and miscalculated the time, your solution blew up on you at the last minute, and so on. You can also use the Grace Period as a general automatic one day extension on an assignment, and privately consider it the absolute final deadline. Use it in whatever way is best for you, but the late penalty after the Grace Period is 100%.

Submission: Assignments must be submitted via the submission page on Quercus. No email submissions will be accepted without my approval first. Please check that you've uploaded the correct file and that it has uploaded correctly. Submissions will be marked as is.

5   Course Policies

Formatting assignments: Your assignments should be neatly formatted so that it is easy to see which question is being answered, and answers should include no work that doesn't relate to the solution. Points may be deducted on assignments that are particularly difficult to follow. You're welcome to use the assignment itself as a template to format your response, but it's not required.

On the R programming language: A part of this course will be learning to use aspects of the R programming language (henceforth: R). Learning a programming language requires practicing with that language; you cannot learn R without typing in examples yourself. You should expect to spend some time working with examples in order to gain familiarity with R. If this is the first time you have worked with a programming language, this will be doubly important, since programming (as a skill) requires an explicitness and attention to detail you might not have needed to deploy before. This is not meant to scare you, but simply to warn you that some aspects of the course may be deceptively more involved than they look at first.

On math: This is not a math-intensive course, but you may occasionally need to perform some basic calculations or rearrange an equation. If you're unclear about the math, it's ok to ask for a clarification.

Communication: Make sure you check your University of Toronto email and Quercus Messages and Announcements regularly, as I occasionally make important announcements. I check my own email regularly, but if I don't get back to you within 36 hours (excluding weekends), it's ok to send me a reminder. For privacy reasons, make sure you use your UofT email address or Quercus to message me.

In the "Subject" line of messages to me, put the course number plus a short descriptor of what the email is about (e..g, LINB04 PSet4 question). When you sign your email, use your full name, and make sure you mention the course at some point in the email. I teach many students, and these two things will help me stay organized with this course and get a reply back to you faster.

Preference on names and pronouns: If you want me to refer to you with a particular name or pronouns, please let me know at a time that works best for you. If I make a mistake, please don't hesitate to politely correct me after class, in office hours, or via email.

Regrades: If you got a mark off for an answer and believe it was in error, we can revisit the mark. To do this, you must provide the following: which specific question to look at, what your answer was, why your answer is correct, and why you think it was marked incorrectly. I will only consider regrade requests if there is a specific question you think was marked incorrectly and you state why you think it was marked incorrectly.

Office hours and appointments: No appointment is necessary to attend office hours—just click the Zoom link on Quercus during my scheduled **office hour** times. You might have to sit in the waiting room for a bit while I talk to students in line before you, but I do get a notification that you're in the waiting room, and I will get to you eventually. If you have a **virtual appointment** with me, use the office hours link on Quercus at your scheduled time, and I'll let you in from the waiting room once I'm ready. For **in person appointments**, come to my office in MW311. My door will be open; if it isn't, come back in a few minutes, since I'm either with someone or away from my office. If I'm with another student, just hang out in the waiting area until we're finished.

Accessibility: Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. Access-Ability Services staff (located in AA142) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. Call 416-287-7560 or email ability@utsc.utoronto.ca. The sooner you let them know your needs the sooner they can help give you the proper accommodations so that you can achieve your learning goals in this course. I'll do my best to remember what accommodations you require, but please remind me as necessary as well. It's not a bother to me at all.

Academic misconduct: "The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters[1] outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment, using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes."

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[1]http://www.governingcouncil.utoronto.ca/policies/behaveac.htm

The university's academic misconduct code is very general, but it applies to collaborating on and discussing assignments with colleagues, friends, tutors, and answering services; using group chats to discuss aspects of an assessment that is still open; looking up answers, code, suggestions, hints, and so on for assessments; getting direct or indirect advice from someone on how to answer a question; using AI to help complete an assessment in part or in whole; and generally circumvent or helping others to circumvent University of Toronto academic misconduct standards of behavior.

6 Schedule

This is a tentative overview of the topics we'll address, in roughly the order we'll address them, along with what assignment will be due around that time. Depending on how quickly or slowly we go through some topics, this particular sequence might change as the semester progresses.

LECTURE SCHEDULE	
Jan 10th	**Week 1**
Introduction Quantitative research in linguistics Introduction to R Read: Baayen Chapter 1 (but skip sections 1.4.3 and 1.4.4)	
17th	**Week 2**
Univariate statistics Issues in sampling Read: Gries Chapter 1, Section 3.4.1	
24th	**Week 3**
Confidence intervals Read: Chapter 4, section 2.2	
31st	**Week 4**
Parametric tests t-tests Read: Chapter 4, sections 3.1.1, 3.2.1, 3.2.2	
Feb 7th	**Week 5**
Non-parametric tests Read: Chapter 4, sections 3.1.2, 3.2.3, 3.2.4	
14th	**Week 6**
Principles of experimental design Read: Chapter 1, section 4	
21st	
Reading week (no lecture)	
28th	**Week 7**
Correlations Read: Chapter 4, section 4	
Mar 7th	**Week 8**
In-class lab	
14th	**Week 9**
ANOVA	
21st	**Week 10**
Chi-square Read: Chapter 4, section 1.1.2	
28th	**Week 11**
No lecture. Class time reserved for working on final project.	
Apr 4th	**Week 12**
Conclusion: Putting it all together	

Last update: February 7, 2023