Dr. Wendell Kimper
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Quantitative Research Methodology

LELA30101 // 2014-2015 // Semester 1

Dr. Wendell Kimper

Course Outline

1 Contact

Dr. Wendell Kimper
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Office: Samuel Alexander S1.121A
Consultation Hours: Monday 15:00–17:00

2 Objectives

In this course unit, you'll gain hands-on experience approaching linguistic data using quantitative and experimental research methods. The focus will be primarily on statistical analysis, but we'll also cover the fundamental principles of research design. Examples will often be drawn from phonology/phonetics, but this course unit is suitable for students in any sub-field where quantitative research skills are used.

By the end of the semester, I want you to be informed consumers of statistics — able to understand and assess the quality of statistical methods in the papers you read, and to use those methods in your own research. These skills are also highly transferable, and will serve you well in a wide variety of careers.

Because we are focusing on fundamentals, we will not have time to discuss more advanced statistical techniques or experimental paradigms. However, you should leave this class with a solid foundation on which to base further education in these topics.

3 Assessment

You will be assessed on the basic of both coursework and a final research project.

Coursework — 20%

This will consist of weekly sets of exercises, designed to assess your understanding of both basic statistical procedures and the software we'll be using.

Feedback on these will be provided globally, in the form of a sample script provided once the exercises have been marked. Common errors will be noted. If you would like further feedback on your assignment, I would be happy to discuss it with you in office hours.

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Research Project — 80%

The research project is due on Monday, 15 December, and is divided into milestones throughout the semester; see the document entitled Research Project Description for more information.

4 Texts

There are two required texts for this course unit:

(1) Crawley, Michael J. (2005). *Statistics: An Introduction Using R.*

(2) Johnson, Keith (2008). *Quantitative Methods in Linguistics.*

Each covers similar material, but they provide somewhat different perspectives. There will be limited access to these books on high demand at the library, but it is absolutely necessary that you obtain copies of your own.

In addition, there are two recommended texts:

(1) Crawley, Michael J. (2007). *The R Book.*

(2) Myers, Jerome L. and Arnold D. Well (2003). *Research Design and Statistical Analysis.*

You are not required to buy these, but they are helpful additional resources, and worth the investment if you intend to make statistical methods a continuing part of your research. There will be limited access to these books on high demand at the library.

5 Software

We will be using the R software package for statistical computing. It is free, open-source, and cross-platform. You can download it here:

`http://www.r-project.org/`

For additional information, see the document entitled Using R.

6 Collaboration

I encourage you to use the Blackboard discussion board and to get together outside of class to discuss the material.

Co-authorship is permitted on the final project. For the coursework, direct collaboration is not permitted. You may discuss the best way to approach the problems, but *what you hand in must be your own work.*

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7 Schedule

Assignments must be handed in *by 5pm on Monday* the week they are due. Readings can be done either before or after the lecture, but should be done before the tutorial when noted as preparation.

	Lecture	Tutorial	Reading
1	**Preliminaries**		Johnson Ch. 1 Crawley Ch. 1–2
2	**Central tendency & variance**	**R fundamentals** *Prep:* Crawley Ch. 2–4	Crawley Ch. 3–4
3	**The normal distribution** *Due:* Exercises #1	**R graphics**	Crawley Ch. 5
4	**Hypothesis testing & the t-test** *Due:* Exercises #2	**Hypothesis formation**	Johnson Ch. 2–2.3, 3–3.1 Crawley Ch. 6 (to p.83)
5	**Count data** *Due:* Exercises #3, Topic ideas	**Research design**	Johnson Ch. 5–5.1 Crawley Ch. 6 (p. 85-90)
7	**Correlation & regression** *Due*: Exercises #4		Johnson Ch. 2.4 Crawley Ch. 6 (p. 93–100), 8
8	**Logistic regression** *Due*: Exercises #5, Research proposal	**Individual Meetings** *Prep:* Research proposal	Johnson Ch. 5.1–5.2 Crawley Ch. 14
9	**Multiple regression** *Due:* Exercises #6		Johnson Ch. 3.2 Crawley Ch. 11
10	**ANOVA** *Due:* Exercises #7, Progress report	**Individual Meetings** *Prep:* Progress report	Johnson Ch. 4–4.2 Crawley Ch. 9 (to p.171)
11	**Complex designs** *Due:* Exercises #8		Johnson Ch. 4.3 Crawley Ch. 9 (p. 172-185)
12	**Student Presentations**	**Extra office hours** Friday 9-11am	