

## A3.2 - Kvantitatiiviset aineistot ja tutkimusmenetelmät

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Instructors:

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## Course Overview

This course will help you become familiar with how to do quantitative research in political science. The goal will be achieved if, by the end of the course, you are able to read, analyze, understand, and critique the research that is done in political science. However, the main goal is to be able to plan and carry out political science research on your own. The hope is that the intuition and skills you learn here will help you in your Bachelor's thesis regardless of the method that you implement.

We will cover a wide variety of topics in this course including frequency distributions, hypothesis testing, correlations, and regression, among others. It is important that you come to class, come to offered labs, and do all of the assignments. Falling behind can be fatal in a cumulative course like this. You will be given both homework assignments and lab assignments, but us instructors will be available to help you with both. These assignments are vital to understanding. This course may be intimidating to some of you. Rest assured that if you work hard and ask questions, you will get through it! The material and techniques you learn in this course are useful (we'll discuss some everyday uses for the sorts of things you will be learning about here) and are really not all that difficult. Your attitude is key - if you are excited to learn a new skill, you probably will. If not, there are no guarantees. If you put the time in, you will succeed, period. In this course, we de-emphasize grades, and instead, we focus on making sure that you have the skills you need to be successful moving forward.

## Course Objectives

Broadly speaking, the major task of this course is the execution of an original, short piece of political science research. Successful execution of the research agenda requires an understanding of the social science research method. In addition, you will be assessed on basic quantitative statistical techniques, and you will be required to complete quantitative lab assignments.

The most important goal of a political science program is to guarantee that students have the skills necessary to study political phenomena. Stated simply, we seek to help our students to

become independent researchers, capable of identifying and articulating hypotheses, seeking information and inputs relevant to the topic, evaluating the credibility of sources and information, applying the appropriate methods and tools for testing or exploring a hypothesis, and drawing proper conclusions based on their findings. In this course, we choose to focus on two broad measures to assess your success:

**Measure 1:** Is able to formulate research questions and place them within the context of appropriate literature.

Table 1: Measure 1 Evaluations

<b>Exceeds Expectations</b>	<b>Meets Expectations</b>	<b>Does Not Meet Expectations</b>
Is able to utilize & apply the three basic forms of inference (deduction, induction, abduction)	Is able to apply two forms of inference (deduction & induction)	Cannot apply basic forms of inference
Can critically evaluate literature appropriate to their research question, using theoretical & empirical tools for critical analysis	Thematically organizes & evaluates literature appropriate to research question	Summarizes appropriate literature
Appropriately places their research question within identified areas of existing literature	Appropriately places research question within identified areas of existing literature	Cannot identify appropriate literature for research question

**Measure 2:** Can develop and follow a quantitative research design.

Table 2: Measure 2: Evaluations

<b>Exceeds Expectations</b>	<b>Meets Expectations</b>	<b>Does Not Meet Expectations</b>
Can formulate a testable research question, with sophisticated means of operationalization of variables	Can formulate a testable research question, with obvious operationalization	Can formulate a testable research question, with weak or incorrect operationalization
Is able to collect data from primary & secondary sources	Can collect data from secondary sources	Can collect data from secondary sources
Can perform, interpret, & analyze appropriate univariate, bivariate, & multivariate statistical procedures of association & causation	Can perform & interpret appropriate univariate, bivariate, & multivariate statistical procedures of association & causation	Can perform appropriate univariate, bivariate, & multivariate statistical procedures of association & causation

## Attendance

Attendance in class is necessary to succeed. Class instruction includes a mixture of lecture and lab instruction in R Statistical Software. We have suggested books that include many of the techniques that you will learn during lab instruction in R. However, if you do not attend class, it will be much harder to understand the intuition behind a function or why a technique might not work. That being said, there is no official attendance policy. If you miss class, your homework and research paper grades might/will suffer. Therefore, we do not want to “double punish” by having an official attendance policy.

Note: In order to circumvent any misunderstandings regarding this course, you are required to complete a quiz on this syllabus before you can access any materials for the class. The quiz can be accessed on Moodle in the quiz section for the course. You must complete the quiz with a score of 100%. If you do not complete the quiz, you will not be able to access any of the necessary information for the course on Moodle. We view the quiz as a contract between the student and ourselves regarding the requirements for the class.

## Homework (10 x 6 = 60%)

Throughout this course there will be 10 homework assignments that you must complete. In order to get any homework credit, you must turn in ALL ASSIGNMENTS. Since the assignments tend to build upon one another as the semester moves forward, failure to complete one assignment will result in a zero for your overall homework grade. The homework assignments are related to either 1.) Your overall research paper, 2.) Lectures and statistical calculations, or 3.) Implementing statistical techniques in R Statistical Software.

**All homework assignments are due on Friday at midnight of the week that they are assigned.** For example, for the first homework assignment (Week 1: Oct. 24th, Homework 1: Observation and Research Question) the due date would be Oct. 28th at midnight. The due date is established in this manner for two reasons. 1. The homework for a topic is due after we have lecture on that topic so that you are able to fully understand the topic before attempting the homework. Although this course has mathematical calculations, it will not operate like a math course. You will not be forced to read a chapter and do the homework on your own before you received instruction on the topic. Instead, it is expected that you will read for a topic and try to understand it on your own. Then, you will have lecture to reinforce the important concepts and help you understand. Finally, you will be expected to complete the tasks. 2. The due date is established in this manner so that you have at minimum two full days after the homework assignment is due to complete the readings for the next topic.

## Research paper = 40%

The major assignment for this class is the creation of an original research paper. The research paper should mirror the format of a peer-reviewed journal article in terms of having an 1. Introduction, 2. Literature Review, 3. Theory, 4. Variable Measurement, 5. Methods, 6. Results, and 7. Concluding section. The most important sections include the variable measurement, methods, and results sections for this course. However, this research paper will be a shorter version of about 10 pages. In this course, we care less about whether the correct mathematical result was found and more about the amount of time and effort you put into explaining substantive results. More information regarding the guidelines will be given throughout the semester as we move forward with the tasks.

Throughout the course, there will be two types of individual tasks related to your research paper that are due. The first set of tasks are larger tasks consisting of handing in your literature review and the initial methods and results sections. Since these tasks are critical for performing well on the final research paper, we will spend considerable time providing you with feedback on these tasks. The second set of tasks that are due include more basic aspects of the research paper, such as identifying a research question, formulating a hypothesis, and providing descriptive statistics on your variables. For these tasks, time permitting, we will discuss your assignments in class as a group. As long as you hand in the second set of assignments, you will receive full credit, as it is unreasonable to assume your first research question or hypothesis will be perfect.

## Required Reading

Healey, Joseph F. 2016. *The Essentials of Statistics: A Tool for Social Research*. Fourth Edition. Cengage Learning.

Galvan, Jose L. and Melisa C. Galvan. 2017. *Writing Literature Reviews: A Guide for Students of the Social and Behavioral Sciences*. Seventh Edition. Routledge Publishing.

Crawley, Michael J. 2013. *The R Book*. Second Edition. Wiley Publishing

Verzani, John. 2014. *Using R for Introductory Statistics*. Second Edition. CRC Press: Taylor and Francis Group.

**Note: These books will be provided for you on Moodle.**

## Class Schedule

NOTE: Reading for a particular day should be done before attending class on that particular day. The schedule is subject to change based on the flow of class discussion.

### **Week 1: Oct. 24th**

Syllabus

Student introductions

Topic: *Introduction: Social Scientific Methodse*

Read: Healey, Ch. 1; Verzani, Ch. 1

[Homework 1: Observation and Research Question - Oct. 28th](#)

### **Week 2: Oct. 31st**

Read: Dolan 2011, Hansen and Dolan 2022, Galvan and Galvan 2017

Topic: *Finding Sources, Reading Literature, Creating a Lit Review & R Software*

[Homework 2 & 3: Annotated Bibliography & Hypothesis - Nov. 4th](#)

### **Week 3a: Nov. 7th**

Topic: *Descriptive Statistics and Central Tendency*

Read: Healey, Ch. 2 & 3

### **Week 3b: Nov. 8th**

Topic: *Measures of Dispersion & Probability and Sampling*

Read: Healey, Ch. 4 & 5

[Homework 4: Descriptive Statistics & Central Tendency - Nov. 11th](#)

### **Week 4: Nov. 14th & 15th**

Topic: *Inference and Sampling & Estimation*

Read: Healey, Ch. 6

[Homework 5: Inference & Estimation - Nov. 18](#)

### **Week 5: Nov. 21st & Nov. 22nd**

Topic: *Hypothesis Testing, One & Two Sample*

Read: Healey Ch. 7 & 8

[Homework 6 & 7: Hypothesis Testing & Literature Review - Nov. 25th](#)

### **Week 6: Nov. 28th & Nov. 29th**

Topic: *Bivariate Association, Linear Regression, & Logistic Regression*

Read: Healey, Ch.12 & 13

[Homework 8 & 9: Association & Regression & Variable Descriptives - Dec. 2nd](#)

### **Week 7: Dec. 5th**

Topic: Open Lab/Class Sessions

[Homework 10: Methods & Results Sections - Dec. 9th](#)

**Week 8: Dec. 12 - Dec. 13**  
Topic: Open Lab/Class Sessions

**FINAL RESEARCH PROJECT DUE - Dec. 16th**