Leiden University | Political Science

Advanced Methodology

Research Master in Political Science & Public Administration
Semester 1, Block 1, 5 ECTS, Level 600, Course Code: 6447RAM13

Tuesday, September 9 - October 25, 2016, 15:00-17:00

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Course Description

The aim of this course is to introduce students to advanced statistical techniques for the analysis of quantitative data that are frequently used in the literature of political science and public administration. The focus is specifically on explaining dynamic changes over time and how to account for contextual, macro-level effects on micro-level relationships. The techniques covered are aggregate and cross-sectional time series analysis and multilevel models.

Method of Instruction

Lectures, discussion, and assignments.

Video Lectures. Lectures covering the topic(s) of a given week are available about one week in advance on Blackboard (as narrated PowerPoint presentation videos in mp4 format and printable PowerPoint lecture slides in pdf format). Students are expected to watch these lectures (and read the assigned readings) before class. Class time will primarily be used to discuss assignments, answer questions, demonstrate the techniques, and work on class assignments (using R).

Readings

Required:


Recommended:

(3 chapters required)

(1 chapter required)
Additional readings (listed in the course schedule below).

**Software**

The course will utilize the software package R (current version: 3.3.1 “Bug in Your Hair”, 2016-06-21), which is available at: http://cran.r-project.org/. The functions of the basic software package can be extended by downloading (once) and loading (always when needed) additional “libraries”. An overview of important packages can be found under http://cran.r-project.org/web/views/. A word of caution: These packages are provided ‘as is’ without any quality control – some have been extensively tested, used, and reviewed in academic journals or textbooks but others might very well produce unreliable results. Very important: Keep them up-to-date (to avoid often obscure error messages)!

**Assignments, Research Paper, and Participation**

The main focus of this course is on building practical statistical data analysis skills. For this reason, the workload consists of four shorter homework assignments and a final research paper. The final grade is based on the assignments (5%, 15%, 20%, 20%) and the final research paper (40%).

**Assignments.** The four individual homework assignments involve the application of specific statistical techniques/procedures covered in the course using either assigned data or data chosen by the student. The assignments have two components: (1) always a short written description, summary, and interpretation of the results (with the R script to replicate and reproduce the analyses included as appendix) and (2) a short PowerPoint presentation that summarizes the key findings for potential presentation in class. The written assignments need to be submitted electronically via Turnitin and as hardcopy in class at the beginning of the subsequent class meeting (unless a different date and time is given). The PowerPoint presentation should be submitted by Email to the instructor one hour before the class meeting. Late submissions are not accepted.* During the course, handouts with the specific requirements for each assignment will be available on Blackboard.

**Research Paper.** At the end of the course, students will write an individual research paper (ca. 3000 words) that uses either an aggregate time series analysis or a multilevel analysis to answer a scientific research question. The research paper should include a short literature review, postulate testable research hypotheses, and then use the appropriate data and statistical technique to test these hypotheses and report the results. A short single-page
proposal (hardcopy only) for the research paper is due October 18, 2016. The final research paper is due on Friday, November 4, 2016 (*Turnitin* and hardcopy). In both cases, late submissions are not accepted.*

*Deadlines.* Assignment and paper deadlines are final and late submissions are not accepted. Properly documented emergencies and *in advance* requested and permitted extensions are exempt from this rule.

**Attendance and Participation.** Class attendance is mandatory. Students who miss more than one class will automatically fail the course. Properly documented emergencies and *in advance* requested and permitted absences are exempt from this rule. While participation is not graded, the seminar nevertheless requires active and informed participation of the students in class discussions. Students are expected to read the assigned readings and to be prepared to present and discuss their homework assignments.

If you have a physical, psychological, medical, or learning disability that may impact on your ability to carry out the assigned course work, please contact the staff in the Institute of Political Science or Public Administration. All information and documentation of disability is confidential.

**Plagiarism**

Plagiarism is understood as presenting, intentionally or otherwise, someone else’s words, thoughts, analyses, argumentations, pictures, techniques, computer programs, etc., as your own work. Plagiarism is not allowed and has serious consequences. Students must be familiar with Leiden University’s rules about plagiarism. They are available at:

[http://www.regulations.leiden.edu/education-students/plagiarism.html](http://www.regulations.leiden.edu/education-students/plagiarism.html)

The departmental rules and procedures with regard to plagiarism can be found at:

[http://www.socialsciences.leiden.edu/politicalscience/students/postgraduate/regulations/plagiarism.html](http://www.socialsciences.leiden.edu/politicalscience/students/postgraduate/regulations/plagiarism.html)

Important note: Plagiarism occurs in both of the following situations:
- Quoting work from other (and outside) sources without attribution;
- Copying the work of others when completing individual assignments.
Course Schedule

September 6, 2016  Course Intro & Time 1: Unit Roots & ARIMA Models  [5A19]

Key Topics: Trends & Drifts, Unit Roots, & ARIMA Models

Literature:

Box-Steffensmeier/Freeman/Hitt/Pevehouse (2014): Ch. 1 & 2 & 5.

Further/Recommended Readings:


Coghlan, Avril. 2015. A Little Book of R For Time Series. Release 0.2. http://a-little-book-of-r-for-time-series.readthedocs.org/ [Note: Short introduction to R and ARIMA time series analysis. The sections 2.5 & 2.6.3 on forecasting are not important and can be skimmed.]


Assignment 1: Plot Stimson’s yearly and quarterly Public Mood series (available on Blackboard) and conduct and compare an ARIMA analysis of both series (due September 13; 5%).

September 13, 2016  Time 2: Intervention & VAR Models  [5A19]

Key Topics: Intervention Analysis, Granger Causality, VAR & ADL models

Literature:

Box-Steffensmeier/Freeman/Hitt/Pevehouse (2014): Ch. 3 & 4. [Note: Skim the details of the SEQ approach and focus more on the ADL & VAR models.]


Further/Recommended Readings:


September 20, 2016  Time 3: Cointegration & ECM Models

**Key Topics:** Cointegration & ECMs

**Literature:**

Box-Steppensmeier/Freeman/Hitt/Pevehouse (2014): Ch. 6 (7 & 8 optional).


**Further/Recommended Readings:**


[and]


[Note: Both texts are classic and very useful introductions to ECM analyses.]

**Assignment 2:** Replicate Toshkov (2011) and compare the results of a VAR, ADL, and ECM time series analysis (due September 27; 15%)

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September 27, 2016  MLM 1: Basic Logic

**Key Topics:** Contextual/Multilevel Effects, Inferential & Statistical Challenges

**Literature:**


Luke (2004): Ch. 1

Field/Miles/Field (2012): Ch. 19.1-19.3

**Further/Recommended Readings:**

Gelman and Hill (2007): Ch. 1-4

Finch/Bolin/Kelley (2014): Ch. 1, 2, 6

**Assignment:** Find a multilevel data set and operationalize a simple regression model (no submission required).
**October 4, 2016**  
**MLM 2: Basic Model (Random Intercepts & Slopes)**  

**Key Topics:** Model Specification, Interpretation & Diagnostics

**Literature:**


Field/Miles/Field (2012): Ch. 19.4-19.6, 19.8


**Further/Recommended Readings:**


Gelman and Hill (2007): Ch. 11 & 12

Finch/Bolin/Kelley (2014): Ch. 3

**Assignment 3: Conduct a MLM analysis with data or your own choice (random intercept model required, random slope model only if needed) (due October 11; 20%)**

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**October 11, 2016**  
**MLM 3: Higher-Level Predictors & Effect Simulations**  

**Key Topics:** Group-Level Predictors, Cross-Level Interactions, Non-Nested Models, Effect Simulations (*Zelig* library)

**Literature:**


**Further/Recommended Readings:**


Gelman and Hill (2007): Ch. 13 & 21

Finch/Bolin/Kelley (2014): Ch. 4


Zelig Project home page: http://zeligproject.org/
[Note: CRAN library and online documentation are for the new and revised version 5 which does not cover multilevel models yet. We use the old version 4; for the older documentation, see link above.]

October 18, 2016 MLM 4: Dichotomous Outcomes

>> Proposal for final research paper due

Key Topics: Dichotomous DVs

Literature:


Further/Recommended Readings:


Gelman and Hill (2007): Ch. 5, 14

Finch/Bolin/Kelley (2014): Ch.7, 8

Assignment 4: Conduct a MLM analysis (dichotomous DV, one random intercept & one group-level predictor required – random slopes & cross-level interactions if needed) (due October 25; 20%)

October 25, 2016 MLM 5/Time 4: Time-Series Cross-Section Models

Key Topics: Linear Time-Series Cross-Section Models for Panel and Cohort Data

Literature:


Field/Miles/Field (2012): Ch. 19.7


*Or a more technical and detailed version:*


Further/Recommended Readings:

Finch/Bolin/Kelley (2014): Ch. 5


November 4, 2016  Research Paper due (40%)
Further Topics

Time X: Event History/Survival Analysis

Key Topics: Cox Proportional Hazards Model

Literature:


Further/Recommended Readings:


Note: Good general introduction; Ch. 4 on Cox Regression (pp. 33-51) most relevant.


Note: Standard reference for event history models in political science, with detailed and fairly non-technical explanations.

Data Sources

Major Multi-Wave Comparative Survey Projects

- (CSES Module 4: 2011-2016 data collection in progress)
- CSES Module 3: 2006-2011
- CSES Module 2: 2001-2006
- CSES Module 1: 1996-2001

European Election Studies (EES): http://www.europeanelectionstudies.net
- EES 2014 (28 countries)
- EES 2009 (27 countries)
- EES 2004 (24 countries)
- EES 1999 (15 countries)
- Earlier years available (1989, 1994)

European Social Survey (ESS): http://www.europeansocialsurvey.org
- ESS Round 7 (2015; early release with 15 out of 22 countries)
- ESS Round 6 (2012)
- ESS Round 5 (2010)
- ESS Round 3 (2006)
- ESS Round 1 (2002)

European Values Study (EVS): http://www.europeanvaluesstudy.eu
- EVS wave 4 2008 (47 countries/regions)
- EVS wave 3 1999 (33 countries)
- EVS wave 2 1990 (29 countries)
- EVS wave 1 1981 (16 countries)

World Values Survey (WVS): http://www.worldvaluessurvey.org
- WVS Wave 2010-2014 (59 countries)
- WVS Wave 2005-2009 (58 countries)
- WVS Wave 1999-2004 (41 countries)
- WVS Wave 1995-1998 (56 countries)
- WVS Wave 1990-1994 (18 countries)
- WVS Wave 1981-1984 (10 countries)

‘Barometer’ Surveys from around the world:
  - Eurobarometer (http://ec.europa.eu/public_opinion/index_en.htm)
  - Afrobarometer (http://www.afrobarometer.org/)
  - Asian Barometer (http://www.asianbarometer.org)
  - Latinobarómetro (http://www.latinobarometro.org/)

Country-Year Data

The International Political Economy Data Resource (Graham, Benjamin A.T., 2015):
http://dx.doi.org/10.7910/DVN/28003