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)


[Note: Pickup and Brandt/Williams are together an alternative to Box-Steffensmeier et al.]


[Note: Classic, accessible, intuitive, and comprehensive statistics textbook that also covers Bayesian approaches; some R code is obsolete.]


[Note: Comprehensive coverage of the ‘nlme’ and ‘lme4’ R libraries, essentially a detailed help file in book form, but short on assumptions and interpretation.]

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:**


Key Topics: Cointegration & ECMs

Literature:

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


Further/Recommended Readings:


[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%)

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).
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%)

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  [5A19]

>> 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%)


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:*

Hooghe, Marc, and Anna Kern. 2015. “Party membership and closeness and the
development of trust in political institutions: An analysis of the European Social Survey,

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:**


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
The Certificate in Advanced Methodology (CAM) is the new International House course aimed at two principal markets: Those teachers looking for a high level of methodological input for reasons of personal self-development to enable them to become more informed and reflective practitioners. Those teachers who are specifically aiming at a Diploma level qualification such as the Cambridge DELTA and are looking for input towards the new DELTA Module 1. Advanced Methodologies for Sustainability Assessment: Theory and Practice. Submit to Topical Collection Review for Sustainability. Journal Menu. Department of Economics, University of Molise, Via De Sanctis, 86100 Campobasso, Italy Interests: multi-criteria; fuzzy set; soft computing; renewable energy; sustainability; circular economy; technology assessment; HyperSoft sets. Special Issues and Collections in MDPI journals. FAQs for International House Bangkok's Certificate in Advanced Methodology teacher training course. What is the difference between the IH Certificate in Advanced Methodology and CELTA? CELTA is a teaching qualification for teachers with little or no experience, seen as a benchmark for teaching quality and widely recognised internationally. The International House Certificate in Advanced Methodology (CAM) serves two main audiences. It offers the high level of methodological input which (1) many teachers seek for reasons of personal self-development and (2) many teachers need as preparation for a Diploma level qualification such as the Cambridge DELTA. The Certificate in Advanced Methodology (IH CAM) course is run online and taught by qualified tutors who have their DELTA or MA and an online teaching qualification. Course dates. 6th February 2021 â€“ 26th June 2021 (including 2 weeks to complete the assessed portfolio).