Georg-August-Universität
Göttingen
Public Law Foundation

Faculty of Business and Economics
Chair of Development Economics
Prof. Dr. Andreas Fuchs

Syllabus

Introduction to Economic Analysis with R

(Einführung in die ökonomische Datenanalyse mit R)

Summer semester 2022

(as of April 13, 2022)

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1. General Information

1.1 Course content

This course introduces the programming language R, a popular tool for empirical economic analysis. No previous knowledge of R is required – the course covers both fundamentals and advanced topics relevant for economists. The course is designed to be highly interactive and the focus lies on learning by doing. It is directed at students at Bachelor, Master, and PhD level. A version of this course will be available as a self-study module online in the future.

1.2 Course goals

The goal of this course is to enable students to conduct their own econometric analyses using the programming language R and to communicate their results effectively. As a side-effect, students deepen their understanding of theoretical economic and econometric concepts as well as the empirical strategies employed in applied research papers. Additionally, students acquire literacy of a general-

purpose programming language and sharpen their abilities to solve problems algorithmically. These skills will allow the students to conduct their own research in empirical theses and translate into better prospects on the job market.

1.3 Prerequisites

Students should be familiar with basic econometrics.

1.4 Credit points

This course is an additional offer; no credit points can be earned.

1.5 Registration

Please register via Stud.IP (course ID: 801762) between **15 April 2022, 00:00** and **30 April 2022, 23:59**. The number of participants is restricted to 20. Students will be admitted on a first-come-first-serve basis. In addition, there will be a waiting list.

2. Course overview

2.1 Description of the teaching and learning methods

The course runs in two blocks on 5-6 May and on 12-13 May 2022. The course language is English. Each topic consists of small chunks of instruction (in the form of live demos, written explanations and code fragments) and is followed by hands-on exercises and the discussion of solutions.

2.2 Meetings

The course takes place in a computer lab but we recommend to use your own computer.

IMPORTANT: At the time we write this syllabus, we expect that this course will take place on campus. However, due to the current situation (coronavirus), we may have to offer this course online instead if the coronavirus situation worsens. Please register for the course on Stud.IP so that you receive all pertinent information in due time (e.g., registration, virtual meetings).

Day 1: Introduction to R [Thursday, 5 May 2022, 16:00 – 20:00 s.t.; MZG 7.153]

- Introduction to R (installing R and R Studio; user interface, project infrastructure)
- Understanding data formats, objects and functions in R; data input and output

Day 2: Introduction to R continued [Friday, 6 May 2022, 09:00 – 19:00 s.t.; MZG 5.111]

- Data cleaning, data subsetting and merging of datasets
- Data wrangling using the "tidyverse" syntax

Day 3: Data visualization [Thursday, 12 May 2022, 16:00 – 20:00 s.t.; MZG 7.153]

- Creating basic layered plots using ggplot2
- Making plots publication-ready

Day 4: Regression analysis and literate programming [Friday, 13 May 2022, 09:00 – 19:00 s.t.; MZG 5.111]

- Linear regression of cross-sectional and panel data
- Modifying formula objects
- Reporting regression results in tables and coefficient plots
- Creating dynamic documents in R Markdown

2.3 Examination and grading of the module

None

2.4 Course materials

We are not really following any textbook, but this comes closest to explaining much of what is covered in the course:

- Grolemund, Garrett and Hadely Wickham. 2022. *R for Data Science*. Available at https://r4ds.had.co.nz/index.html.
- Wickham, Hadley, Danielle Navarro, and Thomas Lin Pedersen. 2022. *ggplot2: elegant graphics for data analysis*. Available at https://ggplot2-book.org/.
- Xie, Yihui. 2022. *bookdown: Authoring Books and Technical Documents with R Markdown*. Available at https://bookdown.org/yihui/bookdown/.

All lecture materials will be published on Stud.IP. In the winter term of 2022, this course will be converted into an online self-study module.