Intermediate Quantitative Methods (Advanced methodology course – practice-related methods)

Title	Intermediate Quantitative Methods (Advanced methodology course – practice-related methods)
Semester	F2024
Master programme in	Global Studies / Internationale udviklingsstudier / International Public Administration and Politics / Business Administration and Leadership / Global and Development Studies / International Politics and Governance / Virksomhedsledelse / European Master in Global Studies
Type of activity	Course
Teaching language	English
Study regulation	Read about the Master Programme and find the Study Regulations at [ruc.dk](ruc.dk)

REGISTRATION AND STUDY ADMINISTRATIVE

Registration	You register for activities through stads selvbetjening during the announced registration period, which you can see on the Study administration homepage. When registering for courses, please be aware of the potential conflicts and overlaps between course and exam time and dates. The planning of course activities at Roskilde University is based on the recommended study programmes, which should not overlap. However, if you choose optional courses and/or study plans that goes beyond the recommended study programmes, an overlap of lectures or exam dates may occur depending on which courses you choose.
Number of participants	
ECTS	5
Responsible for the activity	Camilla Jensen (camje@ruc.dk)
Head of study	Somdeep Sen (sens@ruc.dk)
Teachers	
Study administration	ISE Registration & Exams (ise-exams@ruc.dk)
Exam code(s)	U60379

ACADEMIC CONTENT

Overall objective	A practice-oriented methodology course aims to equip students to competently apply a given technique or tool that is frequently used in practice.
	The course equips students to argue for the applicability and relevance of the technique or tool to the problem, and to apply the technique or tool in work situations.
Detailed description of content	In the first session, we will repeat the fundamentals of running a multiple linear regression model: state the equation for a straight line, explain the method of least squares (OLS), its assumptions and assess the overall fit of a linear model to a particular dataset. We discuss how single factors can affect the accuracy of the model and the general principles of using other types of variables than the purely numerical (scale) ones. In addition to the basic principles of OLS, we discuss situations where the data does not fulfil the assumption of linearity, how to transform the variables in such situations and how to deal with common econometric problems of multicollinearity. Problems of heteroscedasticity (correlation between the error term and model variables) are also touched upon in the introduction.
	In the second session, we continue studying the multiple regression model, but incorporating categorical variables as explanatory factors into our models. We also investigate violations of other aspects of model assumptions (in the first session, we focused on the assumption of linearity), such as normality and independence. Parameter interpretation is less straightforward in some of these models. We see how applying weights can provide for one type of solution to the problem of heteroscedasticity.
	In the third session, we change the assumptions of the linear regression model, but now for the dependent variable. Using a categorical variable instead of a scale variable, we can better test outcome variables from surveys across the social sciences, including the type of variables used in research in political science and sociology. Such as, for example, whether you vote for a specific political party or engage in a social activity. Using logistic regression analysis, but still within a set-up similar to OLS, we can analyse how the probability of such type of outcomes depends on a set of explanatory variables.
	In the fourth session, we focus on factor analyses. Factor analysis explores the options there can be to group or cluster variables or 'latent constructs'. Using this technique can facilitate understanding the underlying structures of a dataset better, and also help reduce the number of variables by creating new constructs or factors. Sometimes we need to measure something that cannot be assessed directly using quantitative data — for example, ability, creativity or extraversion.
	In the fifth and last session, we will introduce a more advanced statistical method (such as multi-level regression or panel data regression). For example, we relax the assumption of homogeneity of equal intercept and/ or slopes among sub-samples in a dataset in this session.The usage of statistical methods in research and how they are presented in scientific articles is evaluated using an exemplary article related with all the methods that were used during the course.
Course material and Reading list	Main texts (a full reading list including supplementary journal articles and reading instructions will be mailed out to the students prior to the beginning of the course):

Bolin, Jocelyn H. (2023). Regression Analysis in R - A Comprehensive View for the Social Sciences. CRC Press, Taylor & Francies Group. (Available online at REX/RUB or also in stock at Academic Books.) (190 pages)

Wooldridge, J. M. (2017). Introductory econometrics: A modern approach. Cengage learning. (Any version or edition of Wooldridge can be used and you can probably find one second-hand quite easily in the Copenhagen area or online). The necessary pages will also be uploaded on Moodle. (70 pages in extract.)

Kim, Jae-On and Mueller, Charles W. (1978). Introduction to Factor Analysis - What It Is and How To Do It, Sage University Paper, 13, Sage Publications. (Can be downloaded from REX.) (50 pages)

Kim, Jae-on and Mueller, Charles W. (1978). Factor Analysis - Statistical Methods and Practical Issues, Sage University Paper, 14, Sage Publications. (Can be downloaded from REX.) (20 pages in extract)

Overall plan and expected work effort	The course is a 5 ECTS and has a total of 135 working hours for students. The hours are planned as follows: course participation: 20 hours (10 times 2 hours); preparation for theoretical sessions: 25 hours (5 times 5 hours); preparation for exercises: 10 hours (5 times 2 hours); mid-term evaluation: 2 hours, homework assignment: 20 hours (5 times 4 hours); exam preparation: 10 hours; assignment: 48 hours.
Format	
Evaluation and feedback	The activity is evaluated regularly in accordance with the study board evaluation procedure. The activity responsible will be informed about a potential evaluation of the activity at semesterstart. See also the link to the study board's evaluation praxis here https://intra.ruc.dk/nc/for-ansatte/ organisering/raadnaevn- og-udvalg/oversigt-over-studienaevn/ studienaevn-for-internationale-studier/arbejdet-medkvalitet- i-uddannelserne/
Programme	See Moodle where the course description including a detailed program will be uploaded.

ASSESSMENT

Overall learning outcomes	At the conclusion of the course, students will be able to: • Explain and evaluate key concepts relating to the given technique or tool, using academically relevant terminology • Argue for the utility of the technique or tool in practice • Master the application of the basic functions of the given technique or tool • Take a critical position in relation to the use of the technique or tool in practice.
Form of examination	Individual written take-home assignment. The character limit of the assignment is: maximum 12,000 characters, including spaces. The character limit includes the cover, table of contents, bibliography, figures and other illustrations, but exclude any appendices. The duration of the take-home assignment is 48 hours and may include

weekends and public holidays.

Assessment: 7-point grading scale.

Form of Re-examination	Samme som ordinær eksamen / same form as ordinary exam
Type of examination in special cases	
Examination and assessment criteria	Argue for the advantages and disadvantages of the methods, tests and statistical tools you choose towards investigating a research question. Conduct your own statistical tests and present results in a consistent and easy to understand manner using statistical software programs. Collect and arrange data, typically from secondary and quantitative online data resources. Present and critically discuss and explain the results of a statistical analysis related to a social science research question. Critically assess the validity and reliability of own and others' research based on statistical criteria and demonstrate ability to understand the limitations of the results. Discuss alternative techniques that could be used and argue for their pros and cons. Discuss data quality and what can be improved in future studies within the field of research. Demonstrate an understanding of requirements and principles of reproduction (chain of evidence) in quantitative scientific research. Develop routines in own statistical work that aim for reproducibility.
Exam code(s)	Exam code(s) : U60379

Course days:

Hold: Group 2

Intermediate Quantitative Methods - exercises, group 2 (BAL, GDS, IPG, VL)

time	13-03-2024 14:15 til 13-03-2024 16:00

location   07.2-008 - undervisningslokale (128)

Teacher   Camilla Jensen (camje@ruc.dk)

Intermediate Quantitative Methods - exercises, group 2 (BAL, GDS, IPG, VL)

time   03-04-2024 14:15 til
03-04-2024 16:00

location   07.2-008 - undervisningslokale (128)

Teacher   Camilla Jensen (camje@ruc.dk)

Intermediate Quantitative Methods - exercises, group 2 (BAL, GDS, IPG, VL)

time   10-04-2024 14:15 til
10-04-2024 16:00

location   07.2-008 - undervisningslokale (128)

Teacher   Camilla Jensen (camje@ruc.dk)

Intermediate Quantitative Methods - exercises, group 2 (BAL, GDS, IPG, VL)

time   24-04-2024 14:15 til
24-04-2024 16:00

location   07.2-008 - undervisningslokale (128)

Teacher   Camilla Jensen (camje@ruc.dk)

Intermediate Quantitative Methods - exercises, group 2 (BAL, GDS, IPG, VL)

time   30-04-2024 14:15 til
30-04-2024 16:00

forberedelsesnorm   ikke valgt

forberedelsesnorm D-VIP   ikke valgt

location   07.2-008 - undervisningslokale (128)

Teacher   Camilla Jensen (camje@ruc.dk)