Mittuniversitetet
MID SWEDEN UNIVERSITY

Kursplan för:

Kvantitativ metod II, 7,5 hp

Quantitative Methods II 7,5 credits

Allmänna data om kursen

Kurskod	TUR010F
Forskarutbildningsämne	Turismvetenskap alt. Övrigt ämne
Nivå	Forskarnivå
Högskolepoäng	7.5
Ansvarig institution	Ekonomi, geografi, juridik och turism
Ansvarig fakultet	Fakulteten för humanvetenskap
Inrättad	
Fastställd	2019-05-15
Senast reviderad	
Giltig fr.o.m	2019-03-01

Syfte

The course Quantitative Methods II is an advanced faculty-wide course for doctoral students with intermediary and advanced levels of statistical knowledge. The course aims at offering doctoral students a comprehensive and in-depth understanding of advanced quantitative statistical analysis techniques. The course introduces a broad range of knowledge in advanced quantitative techniques and assists in practicing related analytical skills. By doing so, the course is providing both, the theoretical and methodological conditions for developing doctoral students as independent and critical researchers in the quantitative Social Science domain. The aim of the course is for doctoral students to understand the potentials of advanced quantitative methods and to be able to interpret related statistical results correctly.

Lärandemål

After completing the course, doctoral students will

• Have an increased understanding about the state of the art of advanced quantitative methods in the field of Social Sciences.
• Critically assess and propose principles for data collection, advanced analysis designs and the appropriate choice of advanced quantitative methods relevant for the analysis of quantitative data in the social science domain.
• Master advanced quantitative methods related to the course content and link them to state of the art research in the field.
• Appropriately synthesize and integrate advanced quantitative methods into the ongoing PhD thesis project.

Innehåll

After an overview of multi-variate methods and basic principles of data examination, the course starts with a recapitulation of multiple regression and factor analytical research designs, respectively. The main part of the course discusses advanced multi-variate dependence and independence techniques, respectively. Within the domain of dependence techniques, the course covers multiple discriminant analysis, logistic regression, multivariate analysis of variance and conjoint analysis. Within the domain of independence techniques, the course covers cluster analysis, multidimensional scaling and correspondence analysis. Moreover, by moving beyond basic techniques, the course introduces into linear structural equation modelling, focusing on the testing of measurement theory (confirmatory factor analysis) and on the testing of structural theory (structural modelling). All multivariate analysis techniques are practiced in a supervised lab-setting employing SPSS® (Statistical Package for the Social Science) and AMOS® (Analysis of Moment Structures) using real-world data. Finally, the course introduces into predictive analytics for Social Sciences. After discussing core concepts of data mining (e.g. overfitting), the course presents major supervised learning techniques for the purpose of classification and estimation: decision trees, k-nearest neighbor, artificial neural networks and support vector machines. In the field of unsupervised learning techniques for the purpose of association analysis, association rule induction is introduced. All predictive analytic techniques are practiced in a supervised lab-setting employing RapidMiner® and using real-world data.

Behörighet

To be admitted to the course, the candidate should be enrolled in a postgraduate program. Most importantly, the candidate should have successfully completed an introductory course on quantitative methods and possess well-grounded knowledge and analytical skills related to basic statistic techniques, such as correlation, T-test, analysis of variance, regression and factor analysis, respectively. A candidate permanently employed at Mid Sweden University can be offered a place on postgraduate courses with vacancies, provided that requirements for eligibility and other conditions have been fulfilled and that the person participates in the course within the terms of his/her employment.

Undervisning

Teaching is conducted in the form of lectures, supervised labs and independent individual studies. Finally, the students themselves work through course readings.

Examination

Individual examination consists of a written assignment, where doctoral students chose and apply relevant advanced methods for the analysis and interpretation of data material. Data has either already been collected by the student or will be provided by the lecturer.

Betygsskala

Underkänd (U) eller Godkänd (G)

Litteratur

Obligatorisk litteratur

Författare:	Cioffi-Revilla, Claudio
Artikeltitel:	Computational Social Science
Tidskrift	Computational Statistics
År/Volym/nr/sidor:	2010/2 May-June/p.259-271
Webbadress:	http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.656.8848&rep=rep1&type=pdf

Författare:	Conte, Roberto et al.
Artikeltitel:	Manifesto of computational social science
Tidskrift	European Physics Journal - Special Topics
År/Volym/nr/sidor:	2012/214/p. 325-346
Webbadress:	https://link.springer.com/content/pdf/10.1140%252Fepjst%252Fe2012-01697-8.pdf

Författare/red:	Hair, Joseph (Jr.), Black, William, Babin Barry, & Anderson, Rolph
Titel:	Multivariate Data Analysis
Upplaga:	7th edition
Förlag:	Pearson Education Limited, Essex, UK
Kommentar:	ISBN: 10: 1-292-02190-X

Författare/red:	Hatcher, Larry
Titel:	Advanced Statistics in Research: Reading, Understanding, and Writing Up Data Analysis
Upplaga:	1st edition
Förlag:	Shadow Finch Media LLC, Michigan
Kommentar:	10: 9780985867003

Författare/red:	Kline, Rex
Titel:	Principles and Practice of Structural Equation Modeling
Upplaga:	4th edition
Förlag:	The Guilford Press, New York
Kommentar:	10: 146252334X

Författare/red:	Larose, Daniel
Titel:	Discovering Knowledge in Data: An Introduction to Data Mining
Upplaga:	1st edition
Förlag:	Wiley, New Jersey
Kommentar:	10: 9780471666578

Författare/red:	North, Matthew
Titel:	Data Mining for the Masses, With Implementations in Rapid-Miner
Upplaga:	3rd edition
Förlag:	CreateSpace Independent Publishing Platform
Kommentar:	10: 1727102479

Författare/red:	Sarwono, Jonathan
Titel:	Advanced Statistics: Made Easy Using IBM SPSS
Upplaga:	1st edition
Förlag:	Independently published
Kommentar:	10: 1973192748

Författare/red:	Vogt, Paul & Johnson, Burke
Titel:	Dictionary of Statistics & Methodology - A Nontechnical Guide for the Social Sciences
Upplaga:	5th edition
Förlag:	SAGE Publication, Washington DC, et al.
Kommentar:	10: 9781483381763

Scientific reports, articles, etc., are communicated and provided at the beginning of the course.