QUANTITATIVE RESEARCH METHODOGIES AND TECHNIQUES II

Professor: **MATTHIAS SEIFERT**

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TEACHING FACULTY

Matthias Seifert is a Professor of Quantitative Methods in the Operations and Technology area at IE Business School. Prior to joining IE, he has spent most of his academic life researching and teaching in the UK, where he was affiliated to the London Business School, Cambridge University and the London School of Economics.

Dr. Seifert is a specialist in the Decision Sciences. His research focuses on decision making under risk and uncertainty, managerial forecasting as well as behavioral operations.

He has received the EFMD/Emerald Outstanding Doctoral Research Award, the Toby Jackman Prize for the most outstanding dissertation in any discipline awarded by St Edmund's College, Cambridge University, as well as various other research awards granted by institutions in Germany, the United States and the UK. His work has appeared in top journals such as Organizational Behavior and Human Decision Processes, Journal of Operations Management, Personality and Social Psychology Bulletin, Harvard Business Review, and MIT Sloan Management Review, among others. Dr Seifert serves on the editorial boards of Journal of Operations Management, Organizational Behavior and Human Decision Processes, and Decision Analysis. His research has been featured by several public media outlets including the Financial Times International ("Professor of the Week"), The Economist, Forbes, Psychology Today, CBS News, Ideas for Leaders, among others and he was recently included in the 2016 list of "The World's Best 40 Under 40 Business School Professors" published by Poets & Quants.

Academic Background
Postdoctoral Researcher, London Business School, UK
Visiting Lecturer, Operational Research Group, London School of Economics, UK
Ph.D. in Management, Judge Business School, Cambridge University, UK.
M.Sc. in Decision Sciences, Operational Research Department, London School of Economics and Political Sciences, UK.
M.A. in International Business, University of Hamburg, Germany.
B.Sc. in Economics, Vaxjo University, Sweden.
B.A. (Hons) in Business Administration, University of Hamburg, Germany.

Corporate Experience
Decision Analyst, Environment Agency, UK
Consultant, Krysalis Decision Technologies Ltd., UK

Teaching Experience
London Business School
London School of Economics
Cambridge University
University College London (UCL)

MODULE OBJECTIVES AND CONTENT

This course, intended as a sequel to Quantitative Methods I, is designed to provide an introduction to several advanced statistical techniques of multivariate data analysis in the social sciences. By the end of this module you will be able to tackle highly complex research questions using sophisticated analytical methodologies.

Lectures will be held in blocks of two 80 minute sessions (except the first session), all of which will take place in the computer lab.

The main text used for this course is:

"*Multivariate Data Analysis*" by Hair, J., Black, W.C., Babin, B.J. and Anderson, R.E., Pearson New International Edition, 2014.

Additional books that may be useful are:

"*Analyzing Multivariate Data",* Lattin, J., Carroll, J.D. and Green, P.E., Cengage Learning, 2003.

"*Statistics*" (10th edition), by McClave, J.T. & Sincich, T., Upper Saddle River, NJ: Prentice Hall, 2006.

"*SPSS 14. Statistical procedures companion*" by Norusis, M. J., Upper Saddle River, NJ: Prentice-Hall, 2006.

"*SPSS 14 Advanced Statistical Procedures Companion*", by Norusis, M. J., Upper Saddle River, NJ: Prentice-Hall, 2006.

"*SPSS Survival Manual: a step-by-step guide to data analysis using SPSS version 15*" (3rd ed), by Pallant, J, Maidenhead: Open University Press, 2007.

During the sessions, SPSS will be used to illustrate the methods discussed in class. If you have never used this package before, I would recommend you to read some introductory manual to get familiar with the software environment. The following link might be useful:

http://www.ats.ucla.edu/stat/

The module is organized around lectures, hands-on exercises on the computer and class discussions. In addition, we will use technical notes when needed, and rely on the SPSS manual to learn how to use the computer to do the work.

Class discussions about selected research papers will be organised from the third session onwards. The papers will be selected according to the particular topic we will be covering at the time, and circulated beforehand. During a class discussion, a topic leader will help lead the discussion of the research paper assigned to him/her. Helping to lead the discussion **does not mean presenting**. Topic leaders are responsible for: (1) developing and asking thought-provoking questions that examine each topic thoroughly; (2) structuring the debate; and, (3) eliciting participation.

Participants are responsible for reading each article and preparing for each day of class as if they were the topic leaders. The idea is not to repeat what is in the paper but to examine: why it is important to read and understand this paper (i.e. relevance); how the theory and methodology of this paper advanced knowledge in a particular area (i.e. contribution); and whether there are any identifiable improvements to the research methodology presented (e.g. reliability, validity and generalisibility of findings).

Your participation during class discussions and your performance as a topic leader will help me to assess your class participation marks. The final project will allow you to pick a research paper of your choice and evaluate it in terms of the methods discussed in class. You will prepare a 15 minute presentation of this paper for the final session of this course.

PROGRAM

SESSION 1
INTRODUCTION TO MULTIVARIATE STATISTICS
? Survey design
? Item generation
? Cronbach´s alpha

Readings:
? -

SESSIONS 2 - 3
PRINCIPAL COMPONENT ANALYSIS
? Introduction to factor analysis
? How many factors to retain
? Rotation
? Factor scores

Readings:
? Lattin et al., Chapter 4

B.C.: Principal Component Analysis

SESSIONS 4 - 5
EXPLORATOY FACTOR ANALYSIS
? Exploring underlying theoretical structures of large variable sets

Readings:
? Hair et al, Chapter 3.

SESSIONS 6 - 7
CLUSTER ANALYSIS
? Introduction
? Hierarchical and partitioning methods
? Assessing cluster solutions
? Two-step clustering

Readings:
? Hair et al. Chapter 8

SESSIONS 8 - 9
DISCRIMINANT ANALYSIS
? Calculating the discriminant function.
? Testing hypotheses about the discriminant function.
? Testing assumptions.
? Discriminant function coefficients.

Readings:
? Hair et al. Chapter 5

SESSIONS 10 - 11

LOGISTIC REGRESSION
? Linear Probability Models.
? Classification.
? Binary Logistic regression.

Readings:
? Hair et al. Chapter 6

SESSIONS 12 - 13

MULTIVARIATE ANALYSIS OF VARIANCE (MANOVA)
? Extending univariate methods for assessing group differences. ? Differences between two independent groups.
? Differences between K independent groups.

Readings:
? Hair et al. Chapter 14.

SESSIONS 14 - 15

PROJECT PRESENTATIONS

EVALUATION CRITERIA

Grades will be assigned as follows:

Criteria	Percentage	Comments
Class Participation	25 %	
Final Project	25 %	
Final Exam	50 %	

BIBLIOGRAPHY

http://ie.worldcat.org/coursereserves/course/fetch/2144241

https://ie.on.worldcat.org/courseReserves/course/id/12594658