



APPLIES TO ACADEMIC YEAR 2012/2013

## GRA 6020 Multivariate Data Analysis

### Programme

Core Course, Master of Science in International Management, Master of Science in Leadership and Organizational Psychology, Master of Science in Political Economy, Master of Science in Strategic Marketing Management

### Responsible for the course

Steffen Grønneberg

### Department

Department of Economics

### Term

According to study plan

### ECTS Credits

6

### Language of instruction

English

### Introduction

### Learning outcome

- To understand and be able to apply some of the most known multivariate statistical techniques to research problems in the student's discipline of interest.
- To illustrate the use of actual statistical software. It is the responsibility of the student to familiarize himself/herself with the fundamentals of this or similar statistical analysis software.
- To provide an understanding for the statistical assumptions underlying these techniques.

### Prerequisites

Bachelor degree qualifying for admission to the MSc Programme. An introductory course in statistics is recommended.

### Compulsory reading

#### Books:

Hair, Joseph F. ... [et al.]. 2010. Multivariate data analysis : a global perspective. 7th ed. Pearson

Jöreskog, Karl G. and Dag Sörbom. 1995. LISREL 8 : structural equation modeling with the SIMPLIS command language. 3rd printing, with foreword and computer exercises. Scientific Software International

#### Other:

During the course there may be hand-outs and other material on additional topics relevant for the course and the examination.

Jöreskog Karl G. 2002. Structural Equation Modeling with Ordinal Variables. (Can be downloaded: <http://www.ssicentral.com/lisrel/ordinal.pdf>)

### Recommended reading

#### Books:

Gujarati, Damodar N., Dawn C. Porter. 2009. Basic econometrics. 5th ed. McGraw-Hill

Kaplan, David. 2009. Structural equation modeling : foundations and extensions. 2nd ed. Sage

### Course outline

1. The basic idea of hypothesis testing.
2. The linear regression model.
3. Qualitative Response Regression Models (Logistic regression)
4. Explanatory factor analysis
5. Exploratory factor analysis
6. Confirmatory factor analysis
7. Structural Equation Modeling

**Computer-based tools**

The course uses modern statistical software. It's learning/homepage

**Learning process and workload**

A course of 6 ECTS credits corresponds to a workload of 160-180 hours. Lectures and exercises.

Please note that while attendance is not compulsory in all courses, it is the student's own responsibility to obtain any information provided in class that is not included on the course homepage/It's learning or text book.

**Examination**

Term paper and a two-hour multiple-choice control exam.

Groups of 2 or 3 students on the term paper which accounts for 75% of the final grade.

The multiple-choice exam is graded and counts for 25% of the final grade and must be passed to obtain course credits.

For further information please see information placed on It's learning and the web.

Specific information regarding student evaluation beyond the information given in the course description will be provided in class. This information may be relevant for requirements for term papers or other hand-ins, and/or where class participation can be one of several elements of the overall evaluation.

**Examination code(s)**

GRA 60205 for the term paper (75%)

GRA 60206 for the multiple choice exam (25%).

**Examination support materials**

All aids are allowed. Only BI-approved calculators are allowed at examinations. Exam aids at written examinations are explained under exam information in our web-based Student handbook. Please note use of calculator and dictionary.

<http://www.bi.edu/studenthandbook/examaids>

**Re-sit examination**

It is only possible to retake an examination when the course is next taught.

The assessment in some courses is based on more than one exam code.

Where this is the case, you may retake only the assessed components of one of these exam codes.

Where this is not the case, all of the assessed components of the course must be retaken.

All retaken examinations will incur an additional fee.

Please note that students who only retake the control exam need to be aware that the exam may be based on the term paper given this semester. Students should therefore regard the term paper as a part of the course literature, even if the students already have a passing grade in the term paper.

**Additional information****Honor Code**

Academic honesty and trust are important to all of us as individuals, and represent values that are encouraged and promoted by the honor code system. This is a most significant university tradition. Students are responsible for familiarizing themselves with the ideals of the honor code system, to which the faculty are also deeply committed.

Any violation of the honor code will be dealt with in accordance with BI's procedures for cheating. These issues are a serious matter to everyone associated with the programs at BI and are at the heart of the honor code and academic integrity. If you have any questions about your responsibilities under the honor code, please ask.