Central European University

BUSI 5100
Quantitative Methods in Management
(2 credits)

Instructor	:	Tibor Vörös (see last page for bio sketch)
Class meets (day and time)	:	see schedule for details
Classroom	:	see schedule for details
Office	:	CEU Business School, Room 514
Tel	:	+36 1 887 5017
E-mail	:	vorost@business.ceu.edu
Office Hours	:	by appointment
Student Office Coordinator	:	Aniko Juhasz: juhasza@business.ceu.edu

Contents

1 Prerequisities

Computer literacy and basic office software skills are assumed. In addition, the completion of the Harvard Online Maths course is expected and assumed. Basic MS Excel skills (functions, cells, calculations etc.) are expected.

CEU Üzleti Kar Közhasznú Non-profit Kft.
Felnőttképzési Nyilvántartási szám: 01-0516-04; Akkreditációs lajstromszám: AL-0515

2 Course Description And Objectives

The main objective of the course is to help develop and enhance quantitative approach & knowledge. This means good quantitative skills, as well as confidence in the usage of statistical methods and their interpretations, focusing on improved decision-making abilities based on quantitative sources.

An additional goal of the course is to ensure a solid background in computer usage for quantitative problems. Throughout the course, MS Excel will be the basic tool, and – depending on time and availability - other statistical software packages may also be reviewed (SPSS, R). We will familiarize ourselves with many topics that will prove to be useful for other disciplines (such as marketing or finance), as well as to be more educated consumers of everyday information.

Upon course completion, you should be able

- ✓ To identify business problems and statistical tools for their solution;
- ✓ Solve them and interpret the results;
- ✓ Recognize any misuse of statistical methods, data and biased interpretation;
- ✓ Become more educated and critical consumers of data and information.

3 Main Topics

- Descriptive Statistics (graphs, tables, most common summary measures)
- Inferential Statistics (hypotheses testing, estimation, correlation, regression)
- Visualization (charts, data aggregation)
- Modeling

4 Required And Recommended Text And Readings

4.1 Required Readings

- Wayne L. Winston: Data Analysis and Business Modeling (MS Excel 2003 & any of the more recent editions are fine) – a free downloadable e-book will be provided exclusively for the course
- Linda Herkenhoff, John Fogli: Applied Statistics for Business and Management using Microsoft Excel (access & download from the CEU Library E-book Collection)

4.2 Recommended Readings

- Thomas J. Quirk: Excel 2013 for Business Statistics (access & download from the CEU Library E-book Collection)
- Online course: Quantitative Methods Online Course by Janice H. Hammond, Harvard Publishing
- http://onlinestatbook.com/2/, online free statistics book. Also downloadable in PDF format
- Conrad Carlberg: Statistical Analysis and/or Business Analysis
- Swift: Quantitative Methods: For Business, Management and Finance
- Try to read regularly at least one of the following: Financial Times and The Wall Street Journal (dailies), The Economist (weekly).

5 Grading

Exam (individual) .....60 points

CEU Üzleti Kar Közhasznú Non-profit Kft.
Felnőttképzési Nyilvántartási szám: 01-0516-04; Akkreditációs lajstromszám: AL-0515

Exercises & Minute papers .....40 points
Maximum Total .....100 points

Class Participation: Please note that attendance is mandatory (see section of Policy on Class Attendance). Hence, the class participation is not merely being a warm body in the room, but being active, and continuously contributing to the courses.

Minute Papers: Minute papers are short written exercises, given at the beginning, during, or towards the end of a class. Their purpose is one or more of the following: (1) to check preparation on the assignment's key points; (2) to stimulate critical thinking and sound reasoning; and (3) to obtain feedback about topics discussed in previous class sessions. Usually minute papers are marked 0-3 points (max. 5).

Exercises and other relevant assignments may be assigned for the purposes of practice, some of which will be collected for review. Most exercises are individual or small team (max. 2-3 participants) based. Examples of exercises: case studies, data analysis, multiple choice tests.

Exam: individual exam in the computer lab: multiple choice and modelling exercises. Closed book, one A4-page can be used.

Example of a data analysis case

You have been hired as Regional Manager for QuickSupplies CEE, as the HQ is not happy with the current results. You have one year historical data (sales transactions). Up till this point the four sales employees were managed from the HQ, but their work was generally unsupervised. As their newly appointed manager, you have very limited information: you have to rely on the data you have just received from the IT Department. Your assistant is at complete loss when you tell her/him the word 'pivot table', so your only option is to analyse the data yourself. You have a couple of hours till the meeting: you will have to outline changes you would like to implement or issues you would discuss with your sales reps. An action plan would also help establishing your position. At least two executives from the HQ will be present when you talk to your sales people. (historical data provided in MS Excel format).

Example of a modelling case

As a manager of a transformer toy manufacturing company, you would like to prepare scenarios for your monthly management meeting. You gather two worksheets for this purpose: the Transformer_Sales worksheet containing the historical sales results based on advertising, pricing and number of salesreps. The second worksheet (Transformer_Income) is a half-complete model of calculating your operating income: as in reality, we do NOT make the assumption that all produced units are sold. Complete the model and create the three (low /mid /high) scenarios for the management meeting.

NOTE: Additional lecture notes and electronic material will be available via the CEU e-learning site. Submissions are ONLY accepted via the e-learning site. E-mailed documents and/or presentations will NOT be accepted. Late submission: 25% of the maximum available score is subtracted/day.

Available Grades

A: Outstanding

Flawless work of extraordinarily high standard: shows thorough understanding of all work covered in class and demonstrates considerable research of both practical and theoretical nature. Presentation of a very high quality meeting both academic

and professional practitioner criteria. Excellent and appropriate use of English language. Shows considerable creativity, covers several issues outside the classroom material and justifies all assertions.

A-: Excellent

Excellent work: some minor flaws and omissions can be found. The arguments, conclusions and justifications are still sound.

B+: Very good

Very good work: showing strong evidence of understanding and some research of both theoretical and practical fields. May have small flaws in the presentation, but generally these errors do not distract the reader from the meaning of the work. The argument may be incomplete.

B: Good

Appropriate, though generally a medium quality work: shows a good attempt at understanding the principles and concepts involved. Good use of the prescribed reading and preferably describes some research. The argument is likely to have serious omissions or errors.

B-: Satisfactory

Satisfactory: a genuine attempt is made to tackle the question, but falls short in a number of areas. Presentation and use of English may be relatively poor. Lack of attention to details and missing research.

C+: Minimum pass

Borderline: little evidence of understanding of the concepts involved. Also little evidence of work.

F: Fail

Has not demonstrated sufficient understanding of the topic to allow a pass grade and credit to be awarded. Serious misunderstandings, insufficient analysis and evaluation.

Grading Scale

Points (%)	Grade
96-100	A
90-95	A-
85-89	B+
80 - 84	B
75-79	B-
60-74	C+
0-59	F

The above table serves as a generic example of the scaling applied: in line with the CEU grading policies the instructor reserves the right to adjust the scale, that is, to grade on a "curve", should he find that significantly more than the usual number of students would not pass the course under the indicated grading scale or should the distribution of the grades represent an unrealistic pattern.

6 Course Outline And Session Assignments

Class sessions and content depend on computer lab availability – updated content is available on Moodle.

Sessions	*Topics*	*Assignments*
1	Introduction, requirements Statistics: descriptive & inferential	

	Descriptive stats: central tendency & variation	
2	Statistics: tools & techniques I Hypotheses testing Correlation, Regression	How to Lie with Statistics
3	Statistics: tools & techniques II Hypotheses testing Correlation, Regression	
4	Modeling & Decision Making in Business I Pivot table, Solver, Regression, Scenario manager	Computer Lab
5	Modeling & Decision Making in Business II Pivot table, Solver, Regression, Scenario manager	Computer Lab
6	Decision Trees & Decision Making Value of Information	Freemark Abbey Winery Abdriged
7	Overview & Practice	Computer Lab
8	Exam	Computer Lab

7 Intended Learning Outcomes

Core Learning Area	Learning Outcome
Interpersonal Communication Skills	Students will learn the terminology used in essential statistical techniques and other decision tools. Students will demonstrate competence in effective writing as well as in oral communication through papers and presentations.
Technology Skills	Students will understand and use tools and software in order to aid their statistical analysis and decision making. They will learn about different situations and circumstances under which they can take advantage of IT. In specific, MS Excel and SPSS will be used extensively throughout the course.
Cultural Sensitivity and Diversity	Students will be introduced to different problems requiring a broad and diverse perspective on statistical methods, primarily when writing business reports. Discussions and articles will demonstrate the importance of sensitivity to the source, presentation as well as interpretation of data.
Quantitative Reasoning	Students will learn how to use statistical tools in numerous, mostly business related situations. These techniques range from basic descriptive methods, such as creating charts and tables, to advanced inferential ones, building a firm understanding in models, analysis and interpretation.
Critical Thinking	Students will learn to identify and carefully analyse problems, and select adequate and most appropriate decision tools in order to solve them.
Ethics and Social Responsibility	Students will demonstrate the ability to understand the importance of approaching all decisions as well as outcomes carefully, taking into account ethical considerations. They will learn throughout the course to recognize the misuse of statistical methods, data and biased interpretation.
Management Knowledge and Skills	Students will gain the ability to apply statistical techniques to problems in their own professional background.

8 Policies On Class Attendance And Participation

Regular and punctual attendance at every face-to-face class session is a requirement of all degree programs at CEU Business School. Each class covers material not found in the readings. Furthermore, participation in class discussions is an important part of the learning experience for all students as well as a factor in grading. If illness or another unusual circumstance requires missing a class, please do your best to inform the instructor (or the Academic Assistant) in advance. A grade of "AF" (Administrative Fail) *WILL* be assigned for failure to regularly attend a course, to drop the course in

time, or to complete requirements on time. Please note that those students who fail to attend *AT LEAST* 80% of the lectures (in full) will be assigned an AF, with *NO* exception.

9 Academic Integrity

All students must adhere to the principles of academic integrity in all work done for this class and for other classes. Attempted cheating in any form, including plagiarism, is extremely serious and can result in dismissal from the School and University.

10 Comments On Group Work

You may be responsible to handle working in groups as well as working alone throughout this course. As a form of voluntary group work, I strongly encourage you to form study groups to work through the course material and practice, particularly if you are experiencing some difficulties.

Should you choose or be required to work in a group for any assignment, please bear in mind that you will be evaluated AS A GROUP, regardless of the amount and distribution of the work input by each individual member. I choose not to ask group members to evaluate one another. Instead, I would like to encourage you to try and split the work in a way that all of you find agreeable, and take responsibility for your portion, while overseeing the others' contribution as well.

11 Brief Bio Of The Instructor

Tibor Vörös has over 15 years of experience both in academic and corporate environments. He has worked in various management areas (knowledge management, decision making, business intelligence, information systems) as practitioner, and also researched these topics and evaluated corresponding frameworks from the theory point of view. Mr Vörös is holding an MSc in Maths, Physics and Information Technology and currently working at the CEU Business School as Senior Lecturer. His research work ranges from social media to cultural and strategic issues for corporations. More recently Mr Vörös spent considerable time on various business simulations and created unique storyboards to help students experience real life problems in classroom situations. Current research work concentrates on the relationship of culture and technology. CEEMAN has selected Mr Voros as the winner of the Innovation in Course Design category for the CEEMAN Champions' Award 2010. Mr Vörös also took part in various industry campaigns, including the Microsoft Business Productivity Infrastructure Optimization campaign or the Cloud Business Transformation approach.

Specialties
Business simulations, cross-cultural approaches, business intelligence, IT management, cloud business transformation

CEU Üzleti Kar Közhasznú Non-profit Kft.
Felnőttképzési Nyilvántartási szám: 01-0516-04; Akkreditációs lajstromszám: AL-0515