



UNIVERSITÀ
CATTOLICA
del Sacro Cuore

Quantitative Methods – Applied Statistics for the Agri-Food system

Prof. DANIELE MORO

COURSE AIMS

The course aims to provide the students with mathematical and statistical tools for the theoretical and applied analysis of the food sector.

COURSE CONTENTS

TOPICS	CFU
<i>Linear Algebra</i> Definitions of vector and matrix; linear independence; matrix operations; rank and determinant; linear systems in matrix form	1.0
<i>Mathematical tools</i> Notion of derivative; partial derivatives and total derivative; unconstrained and constrained optimization; comparative statics	1.5
<i>Random variables and probability distribution</i> Notion of probability; random variables; main distributions (normal distribution); estimators and sampling distributions	1.0
<i>Inference</i> Confidence intervals and hypotheses testing; t , X^2 and F distributions; one-sample and two-sample hypotheses; Chi-squared tests	1.0
<i>Simple linear regression analysis.</i> Least squares estimates; tests for the regression coefficients and for the overall model	0.5
TUTORIALS	1.0



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SCHEDULE

Fall semester

TEACHING METHOD

The course is organized with 5 credit units of class lectures (35 hours) and 1 credit unit of class/lab exercises (12 hours), in which further applications on lectures' notions will be presented. Solving problems is required for passing final examination.

COURSE REQUIREMENTS

It is strongly recommended to attend classes.

CREDITS

6 ECTS

ASSESSMENT METHOD

The assessment will be based on one final written exam and assignments/homework. The global assessment is intended to evaluate the student's skills in managing mathematical and statistical tools.

The final written exam will last 120 minutes. Questions mainly relate to the application of the analytical methodologies presented in class, but they may also refer to theoretical issues. The exam is intended to provide a sufficiently precise measure of the student's learning and to offer to the instructor a grasp of the student's reasoning skills and abilities to use the methodological instruments presented in class.

The assignments/homework will require to solve problems/exercises and to carry out statistical analysis using a specific software.

Further information can be found on the instructor's webpage or on the Faculty notice board.

COURSE READINGS AND MATERIALS

Selected readings from the following textbook:

K. BLACK, *Business Statistics for Contemporary Decision Making*, 5e, John Wiley & Sons, USA, 2007.

C.P. SIMON-L. BLUME, *Mathematics for Economists*, 1e, W.W. Norton & Company, USA, 1994.

Slides and classnotes.

NOTES

Professor Daniele Moro is available to meet students after classes or by appointment (phone: 0523/599292 - daniele.moro@unicatt.it).



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INSTRUCTOR BIO

Prof. Daniele Moro

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