APPLIES TO ACADEMIC YEAR 2011/2012

ELE 3719 Mathematics elective

Programme
Elective

Responsible for the course
Eivind Eriksen

Department
Department of Economics

Term
According to study plan

ECTS Credits
7,5

Language of instruction
Norwegian

Introduction
This course gives an introduction to selected topics in mathematics and probability theory.

Learning outcome
Acquired knowledge
Upon completing this course, the student should have acquired mathematical knowledge in selected topics that are important for finance, economics and statistics. The student should:

- Know important concepts in linear algebra and vector calculus, such as matrices, vectors, determinants, linear independence, eigenvalues and eigenvectors.
- Understand probability models from a mathematical point of view.
- Know examples of the use of matrices in multivariate statistics.
- Know the concept differential equation, and know how differential equations can be used for modelling.
- Understand foundations of variational calculus and know how variational calculus can be used in economics.

Acquired skills
Upon completing this course, the student should have acquired skills including:

- Mastery of calculations with matrices, vectors and determinants, find eigenvalues and eigenvectors, and ability to use this in applications.
- Ability to compute with probabilities and probability models in one or several variables, and to use this in applications.
- Ability to calculate with covariance matrices.
- Ability to solve selected types of differential equations, with and without initial conditions.
- Ability to solve selected optimization problems using variational calculus.

Reflection
Upon completing this course, the student should have strengthened his/her analytical thinking, and have realized the value of precise and systematic work.

Prerequisites
The course builds directly on MET 1180 Mathematics.

Compulsory reading
Books:
Ross, Sheldon M. 2010. Introduction to probability models. 10th ed. Elsevier/Academic Press

Other:
Litteraturen vil bli supplert med handouts

Recommended reading
Books:
Bjørnestad, Harald ... [et al.]. 2010. Matematikk for økonomi og samfunnsfag. 8. utg. Høyskoleforlaget

Course outline
- Linear algebra and vector calculus
- Probability models
- Differential equations
- Economic optimization

Computer-based tools
Not used in this course.

Learning process and workload
The course has 45 hours of lectures. There will be work programmes with problems that the student should solve. Some of the problems will subsequently be solved in class.

Some time in class will be set aside for the students to work on basic problems in topics recently covered in lectures. This will activate the students and increase the learning outcome through the presentation of solutions to the problems.

Activity	**Workload**
Participation in class	45
Independent work on problems	100
Reading of literature	50
Examination	5
Total recommended use of time	**200h**

Use of hours
45 hours of lectures.

Examination
A five hour individual written examination concludes the course.

Examination code(s)
ELE 37191 - Wiritten examination, accounts for 100% of the final grade in ELE 3719 Mathematics elective - 7.5 credits.

Examination support materials
All written support materials permitted (incl. the BI-defined exam calculator, Texas Instruments BA II Plus).

Under information about examinations in the Student Handbook on the web, examination support materials permitted at written examinations are specified. Notice in particular the use of calculators. See http://www.bi.edu/studenthandbook/examaids.

Re-sit examination
A re-sit is held in connection with the next scheduled course.

Additional information