JÖNKÖPING UNIVERSITY
Jönköping International Business School

COURSE SYLLABUS
Mathematical Methods for Economic and Financial Analysis, 7.5 credits

Mathematical Methods for Economic and Financial Analysis, 7,5 högskolepoäng

Course Code:	JMMR20	**Education Cycle:**	Second-cycle level
Confirmed by:	Council for Undergraduate and Masters Education Apr 9, 2019	**Disciplinary domain:**	Social sciences (75%) and natural sciences (25%)
Valid From:	Aug 17, 2020	**Subject group:**	MA1
Version:	1	**Specialised in:**	A1N
		Main field of study:	Economics

Intended Learning Outcomes (ILO)

On completion of the course the students will be able to:

Knowledge and understanding

1. explain or demonstrate how various mathematical constructs within the covered material can indicate economic and statistical relationships.
2. explain the meaning of set and functional notation.
3. explain and discuss information transmitted by analytical methods and model-based argumentation in economics, within the covered mathematical material.

Skills and abilities

4. apply economic concepts with a strong mathematical basis that have a broad use for decision making (for example, equilibrium and disequilibrium, stability, expectations and surprises, systems and dynamics, and the relevance of marginal considerations).
5. determine equilibria in dynamic system, whether each of those equilibria is stable or unstable, and how the dynamic system behaves outside of equilibrium.
6. perform constrained optimisation and determine whether that optimisation leads to maximisation or minimisation given the constraint(s).
7. perform standard operations on matrices, such as addition, multiplication, inversion, and finding eigenvalues.

Judgement and approach

8. carry out mathematical derivations within the mathematical material covered with sufficient thoroughness to avoid largely unnecessary mistakes given time constraints.

Contents

Students in this course are presented with mathematical tools for economic and financial analysis, including matrix algebra and dynamic mathematical systems. It also focuses on mathematical concepts useful for economics- or finance-focused statistics courses at the masters level or above.

The contents of this course include
- Set theory and functions
- Matrix algebra: addition, multiplication, and inversion of matrices, eigenvalues
- Constrained optimisation with inequality constraints
- The envelope theorem
- Difference equations
- Differential equations

Type of instruction

Lectures and homework assignments, many of which are covered in class

The teaching is conducted in English.

Prerequisites

Bachelor's degree in Economics (or the equivalent).

Examination and grades

The course is graded A, B, C, D, E, FX or F.

All of the intended learning outcomes are assessed through written examination. Course grades are given based on the written examination, a final exam and a midterm exam. The final grade recorded is based 80% on the final exam and 20% on the midterm exam. Performance on homework assignment(s) may be incorporated into or replace part of the grade on the midterm. Performance on homework assignment(s) may be incorporated into or replace part of the grade on the midterm.

Registration of examination:

Name of the Test	Value	Grading
Examination	7.5 credits	A/B/C/D/E/FX/F

Course evaluation

It is the responsibility of the examiner to ensure that each course is evaluated. At the outset of the course, evaluators must be identified (elected) among the students. The course evaluation is carried out continuously as well as at the end of the course. On the completion of the course the course evaluators and course examiner discuss the course evaluation and possible improvements. A summary report is created and archived. The reports are followed up by program directors and discussed in program groups and with relevant others (depending on issue e.g. Associate Dean of Education, Associate Dean of faculty, Director of PhD Candidates, Dean and Director of Studies). The next time the course runs, students should be informed of any measures taken to improve the course based on the previous course evaluation.

Other information

JIBS students are expected to maintain a strong academic integrity. This implies to behave within the boundaries of academic rules and expectations relating to all types of teaching and examination.

Copying someone else's work is a particularly serious offence and can lead to disciplinary action. When you copy someone else's work, you are plagiarizing. You must not copy sections of work (such as paragraphs, diagrams, tables and words) from any other person, including another student or any other author. Cutting and pasting is a clear example of plagiarism. There is a workshop and online resources to assist you in not plagiarizing called the Interactive Anti-Plagiarism Guide.

Other forms of breaking academic integrity include (but are not limited to) adding your name to a project you did not work on (or allowing someone to add their name), cheating on an examination, helping other students to cheat and submitting other students work as your own, and using non-allowed electronic equipment during an examination. All of these make you liable to disciplinary action.

Course literature

Literature

Chiang, Alpha C. and Wainwright, Kevin C. (2005) Fundamental Methods of Mathematical Economics
4th edition, McGraw Hill [ISBN: 007-123823-9], or later edition.
Supplementary material may be used.