JÖNKÖPING UNIVERSITY
Jönköping International Business School

COURSE SYLLABUS
Introduction to Mathematical Methods for Economic Analysis, 7.5 credits

Introduction to Mathematical Methods for Economic Analysis, 7,5 högskolepoäng

---

Course Code:	JIMG12	**Education Cycle:**	First-cycle level
Confirmed by:	Council for Undergraduate and Masters Education May 7, 2020	**Disciplinary domain:**	Social sciences (75%) and natural sciences (25%)
Revised by:	Nov 15, 2021	**Subject group:**	NA1
Valid From:	Jan 17, 2022	**Specialised in:**	G1N
Version:	2	**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 basic algebraic concepts (e.g., equations and systems of equations).
2. describe properties of functions of one and many variables.
3. explain concepts of differentiation and integration.
4. classify different types of optimization problems (e.g., single-variable optimization, constrained optimization) and their applications in economics.
5. explain basic concepts in probability theory.

Skills and abilities
6. analyze functions of one and many variables.
7. apply algebraic methods to solve systems of equations.
8. apply mathematical methods to differentiate and integrate functions.
9. formulate simple mathematical models to describe real-world decision-making processes.
10. calculate elementary probabilities.

Judgement and approach
11. choose appropriate mathematical models to analyze economic decisions.
12. reflect on usefulness and limits of mathematical modelling in economics.

Contents

The course provides an introduction to mathematical methods for economic analysis, e.g.,
- equations and systems of equations
- functions (e.g., linear functions, non-linear functions, exponential functions, logarithmic functions) and their properties
- differentiation and integration
- optimization

- probability theory

Connection to Research and Practice

Mathematics is the common language to communicate scientific results in business administration and economics. Mathematical methods that are discussed in the course will enable students to read articles that are published in leading scientific journals – including theoretical studies in entrepreneurship, ownership, and renewal. By enabling students to access knowledge in academic journals, the course content aids students' abilities to enhance their own learning experience. The course demonstrates, moreover, how to apply mathematical tools to describe and explain a variety of real-world decisions in business administration and economics (e.g., production decisions, optimal taxation). Analytical skills obtained in the course are also core competencies in many business environments.

Type of instruction

Lectures and exercises.

The teaching is conducted in English.

Prerequisites

General entry requirements and Mathematics 3b or 3c, Civics 1b or 1a1 and 1a2. Or: English B, Mathematics C and Civics A and required grade Passed or international equivalent.

Examination and grades

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

Individual written exam (ILOs: 1-12) representing 7.5 credits.

Registration of examination:

Name of the Test	Value	Grading
Individual written exam[I]	7.5 credits	A/B/C/D/E/FX/F

[I] All parts of the compulsory examination in the course must be passed with a passing grade (A-E) before a final grade can be set. The final grade of the course is determined by the sum total of points for all parts of the examination in the course (0-100 points). Grade is set in accordance to JIBS grading policy.

Course evaluation

It is the responsibility of the examiner to ensure that each course is evaluated. There must be course evaluators identified among the students. The evaluation is carried out continuously as well as at the end of the course, through a survey. After the course the course Examiner meets with student evaluators to discuss the survey results and possible improvements. A summary report is also created. The report is followed up by program directors and discussed with faculty and relevant others (e.g. Associate Dean of Education, Associate Dean of faculty, Director of PhD Candidates, Dean, or 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

Academic integrity

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

Sydsæter, K., Hammond, P., Støm, A., & Carvajal, A. (2021). *Essential Mathematics for Economic Analysis*, Pearson, 6th edition.

Supplementary material may be provided at the beginning of the course.