GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2023-2024

Mathematics I(B) (F000110)

Course size *(nominal values; actual values may depend on programme)*

Credits 4.0 **Study time 120 h**

Course offerings and teaching methods in academic year 2023-2024

A (semester 2)	Dutch	Gent	lecture
			seminar

Lecturers in academic year 2023-2024

Cornelis, Chris	WE02	lecturer-in-charge

Offered in the following programmes in 2023-2024	**crdts**	**offering**
Bachelor of Science in Business Economics	4	A
Bachelor of Science in Business Engineering	4	A
Bachelor of Science in Economics	4	A
Bachelor of Science in Economics, Business Economics and Business Engineering (Joint Section)	4	A
Linking Course Master of Science in Business Economics	4	A
Linking Course Master of Science in Economics	4	A
Preparatory Course Master of Science in Business Economics	4	A
Preparatory Course Master of Science in Economics	4	A

Teaching languages

Dutch

Keywords

Mathematics, analysis, algebra

Position of the course

The aim of this course is to give the student a deeper understanding and knowledge of the mathematical concepts that are necessary to work with realistic economic models.
On the one hand, mathematical techniques are systematically developed; on the other hand much attention is paid to mathematical ideas and intuition, to a thorough understanding of the theory, and to methodical and logical thinking. These skills are important for the successful application of mathematical knowledge to problems arising in economics or statistics.

Contents

The mathematical concepts being considered are partly a repetition of those subjects studied in the Secondary School, or they are a continuation of them. The contents is a logical continuation of Mathematics I(A). The subjects are motivated by examples coming from economic models.
The following topics are treated:

- Behaviour of functions: extreme values, concavity, applications in economics (optimisation).
- Integral calculus and applications.
- Series: infinite series, power series.
- Linear algebra: linear models in economics, sets of linear equations, matrices,

input-output matrices, determinants.

Initial competences

The student can understand and use mathematical language and can analyse mathematical information using schemes and structures.
The student can use knowledge, understanding and skills acquired in mathematics for exploring, formulating and explaining problems and practical applications from reality.
The student has a basic knowledge of numbers, elementary algebra, real functions and geometry as listed in the final objectives of Secondary Education.
The student has a thorough theoretical and practical knowledge of real analysis, in particular of: elementary functions in mathematics and economics, limits, derivatives and elasticity.

Final competences

1 He/she can think methodically and logically, can analyse and synthesise problems.
2 The student has a thorough theoretical and practical knowledge of linear algebra and real analysis, in particular of: function analysis, optimisation problems, integrals, infinite series and their applications.
3 He/she can translate an economics problem into a mathematical problem, can approach this quantitatively and/or graphically and solve it.
4 The student can work with mathematical techniques, has understanding of mathematical concepts and proofs, can represent functional relations graphically, analyse and interpret them, and when appropriate use a calculator.
5 He/she can mathematically deduce properties of functions and linear models from economics.

Conditions for credit contract

Access to this course unit via a credit contract is unrestricted: the student takes into consideration the conditions mentioned in 'Starting Competences'

Conditions for exam contract

Access to this course unit via an exam contract is unrestricted

Teaching methods

Seminar, Lecture

Extra information on the teaching methods

Theory: lectures. Exercise classes: with individual coaching.
Use of Ufora for the distribution of study and documentation material.

Learning materials and price

Lecture notes and solved exercises are available (together for Mathematics I(A) and I(B): 12 euro). Cost: 12 EUR

References

- SIMON C.P. and BLUME L., Mathematics for economists, W.W. Norton, New York, 1994.
- HOY M. et al, Mathematics for Economics, Addison-Wesley, New York, 1996.
- HAEUSSLER E.F. and PAUL R.S., Introductory Mathematical Analysis, Prentice Hall, New Jersey, 1999.

Course content-related study coaching

During the lectures, the necessary coaching is given for the understanding of the material, and the lecturer is always available for additional explanations. In the lectures, questions testing insight in the theory are used, giving rise to discussion forums. During exercise classes specific training is given by an assistant in order to develop mathematical skills and techniques. Students can contact assistants and the monitor for additional training. The following documents are made available through Ufora: slides of the lectures, questions testing the understanding, preparatory and extra exercises (differentiated according to schooling) with solutions, examples of exam questions.

Assessment moments

end-of-term assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment with open-ended questions

Examination methods in case of periodic assessment during the second examination period

Written assessment with open-ended questions

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

Theory: written examination, during which the insight in mathematical concepts is assessed. During the theory exam, the reproduction of lecture material is not requested, but the understanding of derivations, graphs and arguments is assessed. Also the vertical understanding (interconnections and relations between various methods) is being tested.
Exercises: written examination, during which the use of mathematical techniques and the application of the new material to economics problems is tested.

Calculation of the examination mark