



Course and Examination Fact Sheet: Autumn Semester 2015

1,202: Mathematics A

ECTS credits: 3.5

Overview examination/s

(binding regulations see below)

Central - Written examination (100%, 120 mins.)

Attached courses

Timetable -- Language -- Lecturer

[1,202,1.00 Mathematics A](#) -- English -- [De Giorgi Enrico](#)

[1,202,2.00 Mathematics A \(Normal Speed\): Exercises](#) -- English -- [Baikou Yauhen](#)

[1,203,2.01 Mathematics A \(Reduced Speed\): Exercises, Group 1](#) -- English -- [Baikou Yauhen](#)

[1,203,2.02 Mathematics A \(Reduced Speed\): Exercises, Group 2](#) -- English -- [Kachel Dominik Alexander](#)

Course information

Course prerequisites

The topics of the "Introductory course mathematics". The two-hour introductory course takes place every week in one English group (parallel to the lecture Mathematics A). The introductory course refreshes high school material needed for the lecture "Mathematics A" as well as for economic and business applications. The introductory course is optional and structured in a modular way, so that students can attend only single sessions on specific topics. The topics of the introductory course are not treated during the lecture "Mathematics A", but used for applications in the exercises.

Course content

Quantitative methods provide the foundation for many of the theoretical advancements of modern economics. Nowadays mathematical tools have become an important prerequisite for all those who want to understand the economic and business literature. Students of economics and business are required to achieve a solid understanding of mathematics. This includes mathematical tools such as infinitesimal calculus for functions of one or several variables, optimization with and without constraints, linear algebra and difference equations. Mathematics is also a way to logically structure arguments in order to obtain new hypotheses or statements to be tested on real data.

The lecture introduces the basic mathematical techniques and intends to help students achieve the level of understanding needed to approach the economic and business literature. The lecture also aims to assist students in further developing their mathematical logic.

Topics:

- Mathematical logic, sequences, series
- Financial mathematics
- Functions, inverse functions, logarithm, exponential
- Properties of continuous functions
- Properties of differentiable functions
- Marginal functions, elasticity, growth rate
- Differential, properties of differentiable functions, extreme points
- Taylor polynomials
- Functions of two variables, contour lines, partial derivatives
- Partial elasticities, total differential
- Implicit function theorem, homogeneous functions
- Production functions and homogeneity



Course structure

Lecture:

The two-hour lecture takes place every week in one English group. The lecture introduces the topics and discusses the main applications to economics and business.

Normal-speed exercises:

The two-hour normal-speed exercises take place every two weeks in one English group. There are six exercise series. Each series contains four different types of exercises (open exercises as well as multiple-choice exercises) with complete solutions. The exercise sessions are meant to be the occasion to ask questions and compare different ways of solving the exercises. During the exercise sessions the teaching assistants will solve a selection of exercises, make suggestions on how to address them and discuss typical mistakes. The exercise sessions will provide the highest benefit to students if they prepare the exercises before attending the sessions.

Reduced-speed exercises:

The two-hour reduced- speed exercises take place every week in two English groups. The difference from normal-speed exercises is that the sessions take place on a weekly basis. The additional number of sessions is used to address specific questions and to discuss additional exercises.

Course literature

De Giorgi, E. (2015): *Mathematics*.

De Giorgi, E. und R. Schuppli (2015): *Exercises Mathematics I*

The book and the exercise booklet will be sold during the first week of the semester.

Additional course information

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Examination information

Examination sub part/s

1. Examination sub part (1/1)

Examination time and form

Central - Written examination (100%, 120 mins.)

Remark

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Examination-aid rule

Extended Closed Book

The use of aids is limited; any additional aids permitted are **exhaustively** listed under "Supplementary aids". Basically, the following is applicable:

- At such examinations, all the pocket calculators of the Texas Instruments **TI-30** series and bilingual dictionaries without hand-written notes are admissible. Any other pocket calculator models and any electronic dictionaries are inadmissible.
- In addition, any type of communication, as well as any electronic devices that can be programmed and are capable of communication such as notebooks, tablets, PDAs, mobile telephones and others, are inadmissible.
- Students are themselves responsible for the procurement of examination aids.

Supplementary aids

None.

Examination languages



Question language: English

Answer language: English

Examination content

Topics:

- Mathematical logic, sequences, series
- Financial mathematics
- Functions, inverse functions, logarithm, exponential
- Properties of continuous functions
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- Taylor polynomials
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Examination relevant literature

De Giorgi, E. (2015): Mathematics.

- Chapter 2
- Chapters 3-5 are pre-requisite for Mathematics A
- Chapter 6
- Chapter 7 (definition of series, geometric series, Euler number)
- Chapter 8
- Chapter 9
- Chapter 10
- Chapter 11

De Giorgi, E. and R. Schuppli (2015): Exercises Mathematics A.

Please note

We would like to point out to you that this fact sheet has absolute priority over other information such as StudyNet, faculty members' personal databases, information provided in lectures, etc.

When will the fact sheets become binding?

- Information about courses and examination time (central/decentral and grading form): from the start of the bidding process on 20 August 2015
- Information about decentral examinations (examination-aid rule, examination content, examination relevant literature): after the 4th semester week on 12 October 2015
- Information about central examinations (examination-aid rule, examination content, examination relevant literature): from the start of the enrolment period for the examinations on 02 November 2015

Please look at the fact sheet once more after these deadlines have expired.