



Course and Examination Fact Sheet: Autumn Semester 2018

5,255: Mathematics for Economists

ECTS credits: 6

Overview examination/s

(binding regulations see below)

Decentral - Group examination paper (all given the same grades) (30%)

Decentral - Written examination (70%, 90 mins.)

Attached courses

Timetable -- Language -- Lecturer

[5,255,1.00 Mathematics for Economists](#) -- Englisch -- [Mahmoud Ola](#)

Course information

Course prerequisites

- Assessment level Mathematics I and Mathematics II

Course content

The knowledge gained in the Mathematics Assessment Level courses will be deepened with a particular view on economic applications. This course is especially useful for students studying economics and for those intending to continue with a Master in Economics or the Master in Quantitative Economics and Finance (MiQE/F). New mathematical concepts will be introduced and examples of their economic applications will be illustrated. Topics include: probability theory; selected topics from mathematical analysis; dynamic systems and stability; microeconomic optimization.

Course structure

Part I: Probability Theory

- - Foundations of probabilities
- - Conditional probability and independence
- - Random variables, distributions, expectations
- - Convergence, law of large numbers, central limit theorem, characteristic functions
- - Introduction to advanced topics: martingales, Markov chains, Brownian motion

Part II: Dynamic Systems and Stability

- - Linear difference equations with constant coefficients
- - General properties of differential equations
- - Linear and separable differential equations
- - Stability
- - Systems of differential equations in two variables; Lyapunov Stability Theorem
- - Systems of linear differential equations with constant coefficients

Part III: Topics in Mathematical Analysis and Optimization

- - Taylor polynomials in one and two variables, Taylor's Theorem
- - Linear Algebra Review
- - Quadratic forms and definite matrices
- - Complex numbers
- - Method of Lagrange multipliers for optimization problems with several constraints
- - Implicit function theorem



- - Envelope Theorem
- - Convex analysis and Kuhn-Tucker Theorem

Course literature

- Lecture slides on studynet
- Selected Chapters of "Mathematics" by Enrico De Giorgi
- Selected reading list to be published periodically on studynet

Additional course information

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Examination information

Examination sub part/s

1. Examination sub part (1/2)

Examination time and form

Decentral - Group examination paper (all given the same grades) (30%)

Remark

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Examination-aid rule

Term papers

- Term papers must be written without anyone else's help and in accordance with the known quotation standards, and they must contain a declaration of authorship.
- The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with the APA or MLA standards. The indications of the sources of information taken over verbatim or in paraphrase (quotations) must be integrated into the text in accordance with the precepts of the applicable quotation standard, while informative and bibliographical notes must be added as footnotes (recommendations and standards can be found, for example, in METZGER, C. (2015), Lern- und Arbeitsstrategien (11th ed., 4th printing). Aarau: Sauerländer).
- For any work written at the HSG, the indication of the page numbers both according to the MLA and the APA standard is never optional.
- Where there are no page numbers in sources, precise references must be provided in a different way: titles of chapters or sections, section numbers, acts, scenes, verses, etc.
- For papers in law, the legal standard is recommended (by way of example, cf. FORSTMOSER, P., OGOREK R. et SCHINDLER B. (2018, Juristisches Arbeiten: Eine Anleitung für Studierende (6. Auflage), Zürich: Schulthess, or the recommendations of the Law School).

Supplementary aids

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Examination languages

Question language: English

Answer language: English

2. Examination sub part (2/2)

Examination time and form



Decentral - Written examination (70%, 90 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 mono- or bilingual dictionaries (no subject-specific 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

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Examination languages

Question language: English

Answer language: English

Examination content

- Probability Theory
- Dynamic Systems
- Topics in Mathematical Analysis
- Optimization

Examination relevant literature

- Lecture slides
- Selected reading list to be advertised on StudyNet

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 23 August 2018
- Information about decentral examinations (examination-aid rule, examination content, examination relevant literature): after the 4th semester week on 15 October 2018
- Information about central examinations (examination-aid rule, examination content, examination relevant literature): from the start of the enrolment period for the examinations on 05 November 2018

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