



Course and Examination Fact Sheet: Autumn Semester 2019

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 -- [Apicella Giovanna](#)

Course information

Course prerequisites

Assessment level Mathematics A and Mathematics B

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, characteristic functions, law of large numbers, central limit theorem
- 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 (Canvas)
- 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. (2017), Lern- und Arbeitsstrategien (12th ed., Cornelsen Schweiz).
- 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 and Stochastic Processes.
- Dynamic Systems and Stability.
- Topics in Mathematical Analysis.
- Economic Optimization.

Examination relevant literature

- Lecture slides.
- Lecture notes.
- Selected chapters of "Mathematics" by Enrico De Giorgi.
- Selected reading list to be advertised on StudyNet (Canvas).
- All documents published by 23 November 2019.



Please note

Please note that this fact sheet alone is binding and has priority over any other information such as StudyNet (Canvas), personal databases or faculty members' websites and information provided in their lectures, etc.

Any possible references and links within the fact sheet to information provided by third parties are merely supplementary and informative in nature and are outside the University of St.Gallen's scope of responsibility and guarantee.

Documents and materials that have been submitted no later than the end of term time (CW51) are relevant to central examinations.

Binding nature of the fact sheet:

- Information about courses and examination time (central/decentral) and examination type starting from the beginning of the bidding on 22 August 2019
- Information about examinations (examination aid regulations, examination content, examination-relevant literature) for decentral examinations after the 4th semester week on 14 October 2019
- Information about examinations (examination aid regulations, examination content, examination-relevant literature) for central examinations as from the starting date for examination registration on 4 November 2019

Please consult the fact sheet again after these deadlines have expired.