Doctoral School in Economics, Finance and Management

Course ID REAL ANALYSIS FOR ECONOMICS AND FINANCE

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1. Course details

Semester:	2
Credit rating:	2 ECTS
Teaching units	30
Pre-requisite(s):	
Lecturers:	Martina Fraschini
Administrator:	Roswitha Glorieux
Tutors:	None
Seminar times and rooms:	CK C16
Tutorial times and rooms:	None
Communications	**It is important that students should regularly read their University e-mails, as important information will normally be communicated this way.**
Mode of assessment:	Written exam + Other (e.g., Homework, Oral presentation)
Examination Periods:	June 2023
Course WebPage:	Moodle.uni.lu

2. Aims and objectives

This course aims to equip students with a solid mathematical background useful for research in Economics and Finance. The course will provide students with the fundamentals of real analysis and teach them how to understand and construct a mathematical proof.

Upon successful completion of this course, students will be able to:

- explain the theoretical basis of differential and integral calculus, including the formulation of central theorems and the main features of their proofs;
- explain the theory of metric and their applications;
- apply the theory to solve economic problems, including the construction of proofs.

Course outline

1. Fundamentals: set theory, series, limits, functions
2. Mathematical proofs: logic, methods
3. Metric spaces: definition, compactness, completeness, fixed point theory
4. Continuity: definition, properties of continuous functions, Weierstrass' theorem

References

- Lecture notes.
- Ok, Efe A. (2011). Real Analysis with Economic Applications. Princeton University Press.
- Aliprantis, Charalambos D., and Owen Burkinshaw (1998). Principles of Real Analysis, Third Edition. Academic Press.

Assessment

Students will get a problem set at the end of each class, covering the topics learned during that week. Students are encouraged to work together, but they are expected to participate in the in-class correction actively. The final written exam will be closed-book.

Class participation (in class correction of problem sets) – 30%
Final (written) exam – 70%

Schedule

Feb 23 (Thu), Mar 2, Mar 7, Mar 15, Mar 22, April 6(part 1)
9:00-11:30h 14:00-15:30h