

MA120 Mathematical Foundations

Seminar Leader: Prof. Dr. Ann-Kathrin Blankenberg

Course Times: Mondays and Wednesdays, 10:45-12:15

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Course Description

This course focuses on the (basic) tools important for the study of political science and economics: analytic geometry, functions of a single variable, and calculus. The course will also be of interest for any student with a general interest in mathematics, or who does not intend advanced specialization in economics. This course is highly recommended for students who want to specialize in Economics, but do not have a strong background in mathematics. After successfully completing this course, they will have to take (the more advanced) Mathematics for Economics course in the fall semester.

This course also fulfills the mathematics and science requirement for humanities students.

Learning Outcomes

- Mastery of basic mathematical knowledge and its application to economics
- Ability to understand and participate in debates on the uses of mathematics in economics
- Capacity to complete exercises and projects proper to mathematical analysis or its use in economics

Requirements

Textbook

For this course, we will use the textbook “Maths for Economics” by Geoff Renshaw (4th edition, 3rd edition will work as imperfect substitute) and required readings/exercises will mostly be from this book. It is vital for your success in the course that you prepare our sessions by carefully studying the assigned parts of the textbook and that you carefully do the exercises provided in class and the book. Mathematics is not a topic that is easily understood by just browsing through the readings but requires the actual use of the concepts discussed in class. To be successful, you will need to practice maths continuously and do many more of the exercises than we can actually do together in class. Because of this importance of exercising, an essential part of the grade will be based on the exercises given throughout the course.

Attendance

Attendance at all classes is a crucial part of the education offered by Bard College Berlin and therefore mandatory. Students may be excused if circumstances outside of their control prevent their attendance (e.g. illness, appointment with a government office). These cases are excused if notification is given via email before the course. The instructor may require additional documentation in case of frequent absences during exams/quizzes.

Bard College Berlin does not offer credit for any course in which a student has missed more than 30% of classes, regardless of the reasons for the absences, whether excused or unexcused.

The full Bard College Berlin attendance policy can be found in the Student Handbook, Section 2.8.

Accommodations

Bard College Berlin is committed to inclusion and providing equal access to all students; we uphold and maintain all aspects of Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and the ADA Amendments Act of 2008, and Section 3 of the German Disability Equality Act of April 27, 2002 (Federal Law Gazette I p. 1468). If you have a disability, or think you may have a disability, please contact the Disability Accommodation Coordinator, Atticus Kleen, (accommodations@berlin.bard.edu) to request an official accommodation.

Requests for accommodations should be made as early as possible to ensure adequate time for coordination and planning. Please note that accommodations are not retroactive and may require advance notice to implement.

If you have already been approved for accommodations with the Disability Accommodation Coordinator, please arrange to meet with me outside of class so that we can develop an implementation plan.

Students may face extenuating circumstances related to various personal or external factors, which impact their academic performance. While these circumstances often do not fall within the legal framework of Disability Accommodations, Bard College Berlin is committed to supporting students experiencing such circumstances. A student needing a short extension or a replacement assignment because of an extenuating circumstance is encouraged to make arrangements directly with instructors if possible. If further support is needed, please visit the [Bard College Berlin Accessibility page](#). Questions about this process can be directed to James Harker (j.harker@berlin.bard.edu) or Maria Anderson-Long (m.andersonlong@berlin.bard.edu).

Assessment

Assessment will be based on attendance, preparation for classes, regular and active participation, professionalism (see below), quizzes, exercises as well as a midterm (60 minutes) and final examination (60 minutes).

Exercise Deadlines

Exercises are due before class one week after being given. Those exercises will be given throughout the course where appropriate and constitute an integral part of the final grade.

Policy on Late Submission of Exercises

Essays that are up to 24 hours late can be downgraded up to one full grade (from B+ to C+, for example). Instructors are not obliged to accept essays that are more than 24 hours late. Where a professor agrees to accept a late assignment, it should be submitted by the new deadline agreed upon by both parties. Thereafter, the student will receive a failing grade for the assignment. Grades and comments will be returned to students in a timely fashion. Students are also entitled to make an appointment to discuss essay assignments and feedback during instructors' office hours.

Students receive mid- and end-of-semester grades for their seminar work. Students are entitled to make an appointment with an instructor to discuss seminar participation, or may be asked to meet with the instructor at any stage in the semester regarding class progress.

Grade Breakdown

Seminar preparation, professionalism and participation 20%

Home exercises and Quizzes 20%

Midterm examination 30%

Final examination 30%

Schedule

The Spring semester runs from Monday, January 26 and runs until Friday, May 15, with the Spring break planned from Monday, March 30, - Sunday, April 5, 2026.

- Normal course sessions end on Friday, May 8.
- Completion week is from Monday, May 11 through Friday, May 15.
- Make-up classes and final exams can take place in completion week.
- Students are required to be on campus during completion week.

Classes missed due to federal holidays will not be rescheduled. Classes missed due to conferences or due to illness (of the professor) are rescheduled.

Scheduled class times are available online under the relevant course heading:

<https://berlin.bard.edu/academics/courses/>

The schedule provided is provisional in order to allow for flexibility. It is the students' responsibility to keep themselves informed of any changes to the schedule provided here. An up-to-date schedule will be maintained by the course management on the internet in Google classroom. The password to join google classroom will be handed out in class.

Class sessions will generally consist of three parts: Exposition of mathematical concepts and techniques, exercising their use as well as a discussion of their use in economics via examples where appropriate.

Topics

- Introduction
- Repetition of arithmetic (Renshaw, Ch. 1)
- Algebra and functions (Renshaw, Ch. 2)
- Linear equations (Renshaw, Ch. 3)
- Linear equations and their application in economics
- Quadratic equations (Renshaw, Ch. 4)
- Some further equations and technique (Renshaw, Ch. 5)
- Derivatives and differentiation (Renshaw, Ch. 6)
- Derivatives in action (Renshaw, Ch. 7)
- Economic applications of functions and derivatives (Renshaw, Ch. 8)

Week 7 or 8: Midterm Exam (to be scheduled) - during class hours

Week 15: Final Exam (11.05.2026, 10:45-12:15)

- *Classes missed due to federal holidays will not be rescheduled.*

Professionalism

Being a student is your full-time job and with it come a set of responsibilities and expectations, as with any other job. Maintaining a professional attitude towards your course of study is something that also prepares you for later work life. A professional attitude towards your studies is shown by coming to class on time, being prepared, being courteous to your teachers and fellow students. It is exhibited by writing your essays with care, actively participating in class, avoiding distractions (excessive bathroom breaks, using smartphones to check on irrelevant issues during class etc.), not missing classes except for the most dire of circumstances and in general by adapting to the rules of the course without trying to bargain for personal exceptions.

Ethics/Academic honesty

A core value of the academy is truth and the pursuit thereof. Nothing can shake the foundations of this pursuit as much as academic dishonesty as it undermines the trust that is indispensable to it. This is why I will not excuse any instance of academic dishonesty. Plagiarism, cheating during exams, copying homework assignments (or doing individual assignments with a classmate) all constitute violations of academic honesty and of the clause on “academic integrity” that each student has signed in the student handbook. They can lead to failing the course and will be reflected in the student’s record (having a record of academic dishonesty can make obtaining scholarships, achieving a study abroad place or admission to another program difficult if not outright impossible). If students fail to meet the expected standards of academic integrity, this will be dealt with under the Code of Student Conduct, Section III Academic Misconduct.

(version: 20.11.2025)