

MA120 Mathematics for Economics

Seminar Leader: Stephan Müller
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Office Hours: by appointment

Course Description

This course focuses on the mathematical tools important for the study of economics: analytic geometry, functions of a single variable, functions of two variables, calculus, integrals and linear algebra (matrices, determinants, systems of linear equations and methods for solving them). A large part of the course will deal with optimization in one or more variables and its corresponding applications in economics (e.g. utility and profit maximization problems). 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, but wishes to become informed regarding the essential mathematical building blocks of economics as a discipline.

Requirements

Math Foundation or passing of placement test in the first week of the semester

Textbook

For this course, we will use the textbook “Maths for Economics” by Geoff Renshaw (5th edition, 4th 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.

Academic Integrity

Bard College Berlin maintains the highest standards of academic integrity and expects students to adhere to these standards at all times. Instances in which students fail to meet the expected standards of academic integrity will be dealt with under the Code of Student Conduct, Section 14.3 (Academic Misconduct) in the Student Handbook.

Accessibility

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 longer-term 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).

Attendance

Attendance at all classes is a crucial part of the education offered by Bard College Berlin. To account for minor circumstances, two absences from twice-per-week courses or the equivalent (e.g. one absence from a once-per-week course) should not affect the participation grade or require documentation.

Bard College Berlin may not offer credit for any course in which a student has missed more than 30% of classes, regardless of the reasons for the absences. The full Bard College Berlin attendance policy can be found in the Student Handbook, Section 2.8.

Assessment

Assessment will be based on attendance, preparation for classes, regular and active participation, professionalism, quizzes as well as a midterm (60 minutes) and final examination (90 minutes).

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 30%

Quizzes 20%

Midterm examination 20%

Final examination 30%

Schedule

The fall semester runs from Monday, September 2 and runs until Friday, December 20, with the fall break planned from Monday, October 21, - Sunday, October 27, 2024.

- Normal course sessions end on Friday, December 13.
- Completion week is from Monday, December 16 through Friday, December 20.

- Make-up classes and final exams can take place in completion week.
- Students are required to be on campus during completion week.

Scheduled class times will be available online under the relevant course heading:

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

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

Monday and Wednesday, 10:45-12:15

| | Topic | Reading (Chs in Textbook) |
|---------------------------|---|------------------------------|
| Week 1 – 2.9. & 4.9. | Introduction and Recap from previous maths class including some economic applications | 1 – 3 |
| Week 2 – 9.9. & 11.9. | Recap: Linear equations, quadratic functions | 3 – 5 |
| Week 3 – 16.9. & 18.9. | Recap: Derivatives | 6 – 8 |
| Week 4 – 23.9. & 25.9. | Economic applications of functions and derivatives; Elasticity | 8 – 9 |
| Week 5 – 30.9. & 2.10. | Optimization in two or more independent variables I | 14 |
| Week 6 – 7.10. & 9.10. | Optimization in two or more independent variables II | 14 – 15 |
| Week 7 – 14.10. & 16.10. | Optimization in two or more independent variables III & Midterm | 15 – 16 |
| <i>Fall Break</i> | | |
| Week 8 – 28.10. & 30.10. | Optimization: Implicit differentiation; Economic applications | 16 |
| Week 9 – 4.11. & 6.11. | Economic applications continued; Matrix Algebra I | 16,19 |
| Week 10 – 11.11. & 13.11. | Matrix Algebra II | 19 |
| Week 11 – 18.11. & 20.11. | Integration | 18 |
| Week 12 – 25.11. & 27.11. | Financial math basics | 10 |
| Week 13 – 2.12. & 4.12. | Mathematics of finance and growth I | 10 – 11 |
| Week 14 – 9.12. & 11.12. | Mathematics of finance and growth I | 12 – 13 |
| <i>Completion Week</i> | | |
| Final Exam | 18.12., 13:15 – 14:45 | |