St. Francis Xavier University

Department of Economics

ECON 271.10: Quantitative Methods in Economics

Instructor: Zeynep Ozkok Fall 2022

Office: Mulroney Hall 3061
Telephone: 867-5855
E-mail: zozkok@stfx.ca
Web Page: https://sites.google.com/site/zeynepozkok/
Classes: Monday 3:45 – 5:00 pm and Wednesday 2:15 – 3:30 pm
Office Hours: Wednesday 12:45 pm – 1:45 pm, Thursday 12:00 pm – 1:00 pm

Description

This course introduces students to quantitative and mathematical tools commonly used in the study of Economics and Finance. Topics include functions of one or more variables, financial mathematics, differential calculus, and linear algebra. Applications consist of microeconomic and macroeconomic equilibria, cost minimization and profit-maximization, constrained optimization, interest rates, present value and bond pricing.

Objectives and Learning Outcomes

The course has three main objectives:
(1) To introduce students to basic mathematical tools.
(2) To demonstrate the applicability of these mathematical tools to problems commonly encountered in Economics and Finance.
(3) To prepare students for upper-year Economics and Finance courses where these tools are frequently used.

Prerequisites

ECON 101

Textbook

Bradley, T. (2013) *Essential Mathematics for Economics and Business*, Fourth Edition. Wiley.

Evaluation

The course grade will be determined by the following weighting scheme:

- Mid-term exam: 30%
- Assignments (4): 20%
- Final exam: 50%

Students are expected to attend all lectures. The mid-term exam is scheduled for **October 24** during class time. Students may drop a course, online in Banner, on or before **November 2, 2022** for first-term, three-credit courses. After this date, students are not permitted to drop courses without permission from their Dean. The final exam, to be scheduled by the registrar's office in December 2022, will be cumulative.

Four assignments will be given throughout the term. Students are free to work with other students on these problem sets and submit their work in groups of 1, 2 or 3. Assignments should be handed in during the start of the lecture in which they are due. Late assignments will not be accepted and will receive a mark of zero. The solutions for the assignments will be posted on Moodle.

The office hours for this term will be conducted online on Blackboard Collaborate. The link for the virtual office hours will be posted on Moodle. Please allow for 5 to 10 minutes for everyone to get on Blackboard Collaborate. Aside from the online office hours, you can also send me questions via email and you can request an in-person meeting.

Please note that this in-person course will switch to online delivery if circumstances related to Covid-19 require it in the Fall term. Also, note that the materials in this course are designed for use in Econ 271 at StFX University and are the property of the instructor. Copying this material for distribution, online posting, or selling of this material to third parties for distribution without permission is subject to Canadian Copyright Law and is strictly prohibited. Copying this material for distribution (e.g. uploading material to a commercial third-party website) may lead to a charge of misconduct under StFX's Community Code of Conduct and the Senate Policy on Academic Integrity. For more information, please visit the StFX copyright guide: http://www2.mystfx.ca/library/campus-copyright

COURSE OUTLINE

Part I: Linear Functions

CHAPTERS 1 – 3: *Review of basic linear functions; Modelling of common economic concepts in mathematical form; Solving systems of linear equations; Applications of simultaneous equations in Economics*

Part II: Matrix Algebra & Applications

CHAPTER 9: *Matrices and their operations; Solving systems of equations; Determinants & Matrix Inversions; Cramer's Rule; Solving macroeconomic equilibria*

Part III: Non-Linear Functions and Mathematical Finance

CHAPTER 4 – 5: *Introduction to common non-linear functions; Revenue & cost functions; Applications of non-linear functions; Financial Mathematics; Simple & Compound Interest; Annual Percentage Rate & Net Present Value; Annuities & Debt Repayments; Interest Rates & Bond Prices*

Part IV: Differential Calculus: Unconstrained & Constrained Optimization

CHAPTERS 6 – 7: *First & higher order derivatives; Applications to marginal analysis; Maxima & minima; Partial derivatives; Applications of partial differentiation; Unconstrained optimization; Constrained optimization & Lagrange multipliers; Applications of constrained optimization*

Part V: Integral Calculus & Applications (If time permits)

CHAPTER 8: *Power rule for integration; Area under curves; Computing consumer and producer surplus*

Important Dates

September 6: Fall term classes begin
September 29: December exam schedule is available online
September 30: National Day for Truth and Reconciliation, No classes
October 10: Thanksgiving Day, No classes
October 26: Fall term midterm grades available on Banner
November 2: Last day to drop second-term three-credit courses
November 7 - 13: Fall Study Break
November 14: Classes resume after the study break
December 6: Last day of classes for first term