



ST. FRANCIS XAVIER UNIVERSITY

ECONOMICS

Econ 271

Quantitative Methods in Economics

J. ROSBOROUGH

WINTER 2022

Office: MH 3063

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Office Hours

Mon 2:15pm – 3:30pm

Wed 12:45pm – 2:00pm (or by appointment)

Lectures: MH 2034

Mon 3:45pm – 5:00pm

Wed 2:15pm – 3:30pm

Description of the Course

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 include computing microeconomic and macroeconomic equilibria, profit-maximization, interest rates, present value, and constrained optimization. The objectives of the course are to learn basic mathematical tools; to demonstrate the applicability of these mathematical tools to problems that are commonly encountered in Economics and Finance; and to prepare students for upper-year Economics and Finance courses where these tools are commonly used.

REQUIRED TEXTBOOK: *Essential Mathematics for Economics and Business*
Teresa Bradley, 4th Ed., Wiley, 2013

SUPPLEMENTARY BOOKS

Mathematics for Economists, Carl Simon & Lawrence Bloom, Norton (1994)

Essential Mathematics for Economic Analysis, Sydsaeter & Hammond, Pearson (2006)

COURSE OUTLINE



1. Linear Functions & Equilibria

CHAPTERS 1 – 3: Review of basic linear functions; modelling of common economic concepts in mathematical form; solving systems of linear equations

2. Matrix Algebra & Applications

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

3. Non-Linear Functions and Mathematical Finance

CHAPTERS 4 – 5: Introduction to common non-linear functions; Revenue & cost functions; Simple & Compound Interest; Net Present Value; Annuities & Debt Repayments; Interest Rates & APR

4. Differential Calculus: Unconstrained & Constrained Optimization

CHAPTERS 6 – 7: First & higher order derivatives; applications to marginal analysis; maxima & minima; partial derivatives; constrained optimization & Lagrange multipliers; applications of constrained optimization

5. Integral Calculus & Applications

CHAPTER 8: Power rule for integration; area under curves; computing consumer and producer surplus; finding total cost from marginal cost

Evaluation

Your grade for the course will be determined by the following weighting scheme:

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|----------------------|------------------------------|-----|
| • Problem Sets (4): | Throughout term | 20% |
| • Midterm Exam: | Monday March 7 th | 30% |
| • Final Examination: | TBA by Registrar | 50% |

Classes & Exams

You are expected to attend all lectures and the midterm will be scheduled during class time. The final exam for the course is cumulative and will cover material from the whole term.

Health & Safety

The structure and delivery of this class are subject to change if warranted by health and safety conditions on campus over the term. If you are feeling unwell, please stay home and be sure to review the self-assessment protocols provided by the University and the province. I will make every effort to provide accommodations where necessary, so please feel free to contact me if you have any concerns.
