

MATHEMATICAL ECONOMICS, ECON 471
Department of Economics
St. Francis Xavier University
Winter 2022

Instructor: Teng Wah LEO

Time Blocks and Location: W1/W2 (Monday 9:45 a.m.–11 a.m. & Wednesday 8:15 a.m.–9:30 a.m.) at Nicholson Tower, NT412

Office Hours: Mondays from 12 p.m.–2 p.m. & Wednesdays from 10 a.m.–1 p.m. at Mulroney Hall, Room 3073. All other times, by appointment only. During the first two weeks of class, office hours will be via moodle via appointment only.

Objective: The course is designed to provide a mathematical foundation for Advanced Microeconomics and Macroeconomics, and future graduate work. Mathematical techniques covered includes advanced calculus, matrix algebra, ordinary differential equations, optimal control & dynamic programming. These techniques will be applied to both micro- and macro-economic models. **Prerequisites:** MATH 111, MATH 112.

Evaluation:

1. 40% – 4 × Assignments
2. 30% – Mid Term Examination/Take–Home Essay
3. 30% – Final Examination/Take–Home Essay

Required Text:

None.

Supplementary Reading:

Carl P. Simon & Lawrence Blume. *Mathematics for Economists*, 1st edition, W.W. Norton & Company, 1994.

Kevin Wainwright & Alpha C Chiang. *Fundamental Methods of Mathematical Economics*, 4th edition, McGraw-Hill, 2004.

Alpha C Chiang. *Elements of Dynamic Optimization*, 1st Edition, McGraw-Hill, 1992.

Course Outline:

1. Revision of Calculus
2. Revision of Linear Algebra
3. Euclidean Spaces & Independence
4. Limits & Open Sets
5. Advanced Linear Algebra
6. Optimization
7. Ordinary Differential Equation & Optimal Control Theory
8. Dynamic Programming (Course Notes)