Mathematical Economics, ECON 471:20
Department of Economics
St. Francis Xavier University
Winter 2024

Instructor: Teng Wah LEO

Time Blocks and Location: W1/W2 (Monday 10 a.m.–11:15 a.m. & Wednesday 8:30 a.m.–9:45 a.m.) at Schwartz, SCHW190

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.**

Drop-Date:
Students may drop a course, online in Banner, on or before **March 8th, 2024**. After this date students are not permitted to drop courses without permission from their Dean. (Please see 3.1 in academic calendar for policy regarding course drops).

Evaluation:

1. $40\% - 4 \times$ Assignments

2. $30\% -$ Mid Term Examination/Take$-$Home Essay, $4^{\text{th}} March, 2023.$

3. $30\% -$ Final Examination/Take$-$Home Essay

Note: All tests and examinations are compulsory. Should you miss an examination/test without an appropriate reason provided prior to the date of the examination/test at the latest, you will be awarded a mark of zero for that examination/test. There is no recourse after the fact.

Equitable Learning: Everyone learns more effectively in a respectful, safe, and equitable learning environment, free from discrimination and harassment. I invite you to work with me to create a classroom space $-$ both real and virtual $-$ that fosters and promotes values of human dignity, equity, non-discrimination, and respect for diversity.

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