

# Enquire Teaching Timetable

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## Course Outcome

### ECON 4110 - Introductory Mathematical Economics

#### Learning Outcome

1. Learn basic tools in mathematical analysis and their applications to mathematical economics.
2. Learn formal mathematical reasoning, and how to read and write proofs.
3. Learn mathematical tools that are widely used in economic theory, such as logic, sets, functions, sequences, continuity, open sets, closed sets, compact sets, maximum existence theorem, separating hyperplanes, and fixed points.
4. Learn basic results in mathematical economics, such as preference, utility, demand, general equilibrium, Pareto optimality.
5. Improve ability of reading academic papers in economic theory.

#### Course Syllabus

1. Logic and Proofs
2. Sets and Functions
3. Preference and Utility
4. Sequence, Limit, Continuity
5. Existence of Utility Representation
6. Compact Set and Maximizer Existence
7. Consumer Demand
8. Exchange Economy
9. Separating Hyperplanes and Two Welfare Theorems
10. Fixed Points and Existence of Competitive Equilibrium

#### Assessment Type

#### Feedback for Evaluation

Course and teaching evaluation done by the Department at the end of the course  
Informal channels (face-to-face discussion, e-mail, etc.)

#### Required Readings

Lecture notes provided by the teacher.

#### Recommended Readings

- Arrow, K. J., and Debreu, G. (1954): "The existence of an Equilibrium for a Competitive Economy" *Econometrica*, 22: 265-290.
- Bartle, R. G., and Sherbert, D. R. (2000). *Introduction to Real Analysis*, 3rd edition. John Wiley & Sons, Inc., New York.
- Border, K.C. (1985). *Fixed Point Theorems with Applications to Economics and Game Theory*. Cambridge University Press: London.

- Chiang, A.C., and Wainwright, K. (2005). *Fundamental Methods of Mathematical Economics*, 4th edition. McGraw Hill Companies, Inc., New York.
- Debreu, G. (1982): "Existence of Equilibrium," in Chapter 15 of *Handbook of Mathematical Economics*, Volume II, (edited by Arrow, K. J., and Intrilligator). North Holland Publishing Company: New York.
- Enderton, H. B. (1972). *A Mathematical Introduction to Logic*. Academic Press, Inc., New York.
- Mas-Colell, A., Whinston, M.D., and Green, J. (1995). *Microeconomic Theory*. Oxford University Press, Inc., New York.
- Rudin, W. (1976). *Principles of Mathematical Analysis*. 3rd. edition. 1986. McGraw-Hill, New York.
- Varian, H. (1984). *Microeconomic Analysis*, 2nd edition. W.W-Norton & Company, New York.