

Summer 2014  
**Mathematics II**  
Wednesday 10:30-12:10

April 9, 2014

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The aim of this course is to provide students with basic tools in Analysis that are needed in advanced level micro and macro economics. The course covers the main part of the Mathematical Appendix in Mas-Colell, Whinston, and Green.

Course information will be posted at

<http://www.oyama.e.u-tokyo.ac.jp/mathii14/>

**Topics**

1. Real numbers (Debreu 1.5)
2. Continuous functions and compact sets (MWG M.F; Debreu 1.6, 1.7)
3. Correspondences (MWG M.H; Debreu 1.8)
4. Differentiation in one variable
5. Differentiation in several variables (MWG M.A, M.B, M.E)
6. Convex sets and (quasi)concave functions (MWG M.C)
7. Negative (semi)definite matrices (MWG M.D)
8. Unconstrained maximization (MWG M.J)
9. Constrained maximization (MWG M.K)
10. Envelope theorem (MWG M.L)
11. Separating hyperplane theorems (MWG M.G, M.M)
12. Fixed point theorems (MWG M.I)
13. Dynamic programming (MWG M.N; Stokey-Lucas 4)

### **Textbook**

- A. Mas-Colell, M.D. Whinston, and J.R. Green, *Microeconomic Theory*, 1995.

### **References**

- G. Debreu, *Theory of Value*, Yale University Press, 1959.
- N.L. Stokey and R.E. Lucas, *Recursive Methods in Economic Dynamics*, Harvard University Press, 1989.

### **Grading**

Midterm exam 40%, Final exam 60%

### **Office hours**

Fridays 14:00-15:30, or by appointment  
10th floor, 1012