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Mathematical Methods II - Applied Intertemporal Optimization

GSEFM 1st year PhD programme

Winterterm 2012/13

(September 2012)

1 A brief overview

The course “Mathematical Methods” covers topology and probability theory in part 1 and difference and differential equations and dynamic optimization in part 2. Lectures for part 2 take place on Monday from 10:15 to 11:45 and 12:15 to 13:45 on the following dates:

- December 10 and 17
- January 14, 21 and 28
- February 4 and 11

All lectures take place on Campus Westend in the Hörsaalzentrum - HZ 5.

All material for part 2 is based on the textbook „Applied intertemporal optimization“. It can be downloaded from <http://www.macro.economics.uni-mainz.de/663.php>. There will be lectures only and no tutorials. Some problem sets will be announced during the lectures. They have to be solved (in groups or alone) and have to be handed in at the beginning of the subsequent lecture. Solutions to problem sets will be distributed in printed form one lecture later.

The date and place of the final exam will be announced. It will take 60 minutes and covers part 2 only. The exam requires students to answer 2 out of 3 questions. Problem sets to be handed in before each lecture (apart from the 1st one) will be weighted 20% (of part 2) when computing the final mark.

2 Contents

- Deterministic worlds

Difference equations and dynamic optimization: ch. 2.1, 2.2 and parts of (po) 2.5

Dynamic optimization: ch. 3.1, po 3.2, 3.3 and po 3.4

Differential equations: ch. 4.1, po 4.2, po 4.3, po 4.4

Dynamic optimization: 5.1, 5.3, 5.4, 5.5 and po 5.6. ch 6.1 and 6.2

- Stochastic worlds

Stochastic difference equations: ch. 7.4.1

Dynamic optimization: ch. 8.1, po ch. 9.1, 9.2 and po 9.5

Stochastic differential equations: ch.10.1, 10.2, 10.3, 10.4, 10.5

Dynamic optimization: ch.11.1, 11.2, 11.3 and 11.5

For all questions concerning the lecture, please contact Klaus Wälde. For all other issues, please contact Michael Lamprecht at lamprecht@uni-mainz.de.