ECO 1011 H1F

Mathematics and Statistics for PhD and MA Doctoral Stream Students

Department of Economics, University of Toronto

Summer 2017

Instructor: Prof. Martin Burda
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Dates: August 16 – September 5, every working day (except Sep. 4 holiday)
Times: 10:00 am – 4:00 pm
Location: WO 35

Course Description

The course provides an intensive introduction to rigorous mathematical and statistical analysis at the graduate level. Statistical software will be used in class assignments. All PhD and MA students in the doctoral stream are required to take the course.

Course Materials

Course materials consist of lecture notes that will be presented during the class time. There is no textbook for the course.

Evaluation

The final grade (credit or no credit) is based on the following:

Task	Date
Term Test 1	August 25, 2017
Term Test 2	September 5, 2017

Credit for the course is earned by scoring at least 50% on Term Test 1, and at least 50% on Term Test 2. In exceptional circumstances the instructor may require a written assignment that will enter the final grade. There are no make-up tests or any additional tests after the course finishes.

ECO1011, Summer 2017, Timetable of Lectures

Day	Date	Part	Coverage
		a	0. Intro, 1. Methods of Proofs
Wednesday	Aug 16	b	2. Set Theory
		c	3. Metric Spaces
		a	4. Analysis in Metric Spaces
Thursday	Aug 17	b	5. Vector Spaces
		c	6. Linear Algebra in Vector Spaces
		a	7. Analysis on the Set of Real Numbers
Friday	Aug 18	b	8. Continuity and Correspondences
		c	9. Eigenanalysis
		a	10. Numerical Analysis
Monday	Aug 21	b	11. Unconstrained Optimization
		c	12. Constrained Optimization
		a	13. Dynamic Optimization
Tuesday	Aug 22	b	13. Dynamic Optimization
		c	14. Dynamic Programming
		a	15. DP Application - Optimal Economic Growth
Wednesday	Aug 23	b	16. DP Application - Labor Supply
		c	17. Dynamic Optimization in Continuous Time
		a	Appendix 1 - Practical Dynamic Programming
Thursday	Aug 24	b	Appendix 1 - Practical Dynamic Programming
		c	Q&A session
Friday	Aug 25		Term Test 1
		a	18. Introduction to Probability
Monday	Aug 28	b	19. Measure-Theoretic Probability
		c	20. Random Variables and Distributions
		a	21. Statistical Properties of Estimators
Tuesday	Aug 29	b	22. Bootstrap Methods
		c	23. Interval Estimation and Hypothesis Testing
			24. Regression with Matrix Algebra
Wednesday	Aug 30		25. Maximum Likelihood
			25. Maximum Likelihood Asymptotics
		a	26. GMM
Thursday	Aug 31	b	27. Testing of Nonlinear Hypotheses
		c	28. Elements of Bayesian Analysis
		a	Appendix 2 - MCMC
Friday	Sep 1	b	Appendix 2 - MCMC
		c	Q&A session
		a	
Monday	Sep 4	b	Labor day, U of T closed
		c	
Tuesday	Sep 5		Term Test 2