Syllabus for Econ 525a
Macroeconomics and Inequality: Models and Methods

Course Objectives: The purpose of this course is twofold: first, to introduce students to macroeconomic models of inequality; second, to introduce students to computational tools for conducting numerical analysis and statistical estimation of such models.

Contact Information
Office: 28 Hillhouse, Room 306
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Course web site: aida.wss.yale.edu/smith/econ525a2014/
Office hours: Mondays from 9AM to 11AM

Course Meetings: The course meets on Fridays from 9AM to noon in Room 106 at 28 Hillhouse.

Prerequisites: This course is designed for graduate students in economics who have taken first-year graduate courses in microeconomics, macroeconomics, and econometrics. No prior knowledge of either numerical methods or computer programming is assumed, but some familiarity with a programming language would prove helpful.

Course Requirements: Students will be asked to complete a small number of problem sets (including some with exercises in computation), to present to the class a published article (or working paper) to be chosen in consultation with me, and to write a term paper. The term paper could be a step towards independent research on macroeconomics and inequality, or it could be a replication of the numerical analysis in an existing article or working paper.

Texts: The lectures will be largely self-contained, but there are several good texts that provide useful complements to the material on numerical analysis taught in the lectures. Two especially valuable books are Numerical Recipes in Fortran 77: The Art of Scientific Computing, Second Edition (Volume 1 of Fortran Numerical Recipes), by William

Other useful books on numerical analysis of economic models include:


For the theory underlying macroeconomic models of inequality, students will find Chapters 8, 17, and 18 in *Recursive Macroeconomic Theory, Third Edition* by Lars Ljungqvist and Thomas J. Sargent (MIT Press, 2012) useful.
APPROXIMATE SCHEDULE


Week 3: Numerical methods: root finding (Chapters 1, 5.7, and 9 in Numerical Recipes; Appendix 2A, Chapter 3, and Chapter 5.6 in Miranda and Fackler; Chapters 1, 2, 5, and 7.7 in Judd); minimization in one or more dimensions (Chapter 10 in Numerical Recipes; Chapter 5 in Miranda and Fackler; Chapter 4 in Judd).

Week 4: Numerical methods: interpolation and approximation of functions (Chapters 3 and 6 in Numerical Recipes; Chapter 5 in Miranda and Fackler; Chapter 6 in Judd).

Week 5: Numerical methods: numerical integration (Chapters 4 and 7 in Numerical Recipes; Chapter 5 in Miranda and Fackler; Chapters 7 and 8 in Judd).

Week 6: Numerical methods: numerical dynamic programming (Chapters 7, 8, and 9 in Miranda and Fackler; Chapters 12, 13, 16, and 17 in Judd).

Week 7: Computing the Aiyagari model. The Krusell-Smith model and its computation (Krusell and Smith, “Income and Wealth Heterogeneity in the Macroeconomy,” Journal of Po-

Week 8: *Policy analysis* (Heathcote, Aiyagari and McGrattan, Krusell et al, McKay and Reis, Guerrieri and Lorenzoni).

Week 9: *Inequality and power laws* (Gabaix, Benhabib, Nirei, Piketty).

Week 10: *Structural estimation of models of inequality* (Guvenen and Smith).

Week 11: *Student presentations*.

Week 12: *Student presentations*. 