

Economics 8823  
**Advanced Macroeconomics III**  
**Syllabus**  
Professor Sanjay Chugh  
Spring 2019

**Meetings:** Wednesdays and Fridays, 12:45pm – 3:25pm  
**Enarson Building Room 015**

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**Prerequisites:** The first-year economics Ph.D. sequence. Auditors and other upper-level students welcome.

**Grading:** The final course grade will be based on:

1. Completing a “computational primer:” solving computationally for the deterministic steady state of the basic RBC model – **10% of final grade.**
2. Computationally solving and simulating the basic RBC model, tabulating business cycle statistics and impulse responses – **20% of final grade.**
3. Two or three other projects to be assigned during the course, each of which will be computationally and/or analytically oriented – **(total of 40% of final grade).**
4. In-class presentation of a paper (from a designated set of papers) – **20% of final grade.**
5. Assorted assignments, short writing pieces, quizzes, etc – **10% of final grade.**

**Reference Texts:** Some “all-purpose” macroeconomics and texts that are likely to be useful to have on your shelf/eshelf:

1. *Equilibrium Unemployment Theory*, 2<sup>nd</sup> edition, 2000. By Christopher A. Pissarides. MIT Press.
2. *Labor Markets and Business Cycles*, 2010. By Robert Shimer. Princeton University Press.
3. *Recursive Macroeconomic Theory*, 4<sup>th</sup> edition, 2018. By Lars Ljungqvist and Thomas J. Sargent. MIT Press.
4. *Recursive Methods in Economic Dynamics*, 1989. By Nancy L. Stokey and Robert E. Lucas, Jr., with Edward C. Prescott. Harvard University Press.

**Objectives:** There are three main objectives for the course.

1. First, the course will trace through some seminal branches of macroeconomic theory over the past 30 years. Emphasis will be on business cycle modeling (which was one of the proximate cause of the revolution in macroeconomics 30 years ago) and macro-labor issues. We will trace these arcs of thought through to modern quantitative partial equilibrium and general equilibrium business cycle models, and identify/examine where some of the current research frontiers lie.
2. A second fundamental objective is to either get started on or continue becoming comfortable with computational solutions of partial equilibrium and general equilibrium business cycle models. Modern macroeconomics can be computationally intensive. We will study basic tools that macroeconomists use to approximate and solve business cycle models.
3. Third, a necessary condition to be a successful economist (not just a successful macroeconomist) is effective communication skills, both written and spoken. It is never too early to begin (or continue) developing such skills. The required in-class presentation of a paper (from among a set of papers I will designate as “student presentation”) fosters this objective.

**Outline of Topics:** The following is a list of topics and references. Due to time constraints, we will certainly not be able to cover all of these topics. Nevertheless, the topics we skip are, in my view, important ones in macroeconomics, so selected important readings and references for these are provided.

## **UNIT I: Arrow-Debreu General Equilibrium Theory and Introduction to Computational Methods and Tools**

### **1. Review of / Basics of Dynamic Programming**

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1. Prescott, Edward C. and Rajnish Mehra. 1980. "Recursive Competitive Equilibrium: The Case of Homogeneous Households." *Econometrica*, Vol. 48, p. 1365-1379.
2. Ljungqvist and Sargent text, Chapter 1.4, Chapter 2.2, Chapter 3, 4, 5
3. Stokey, Lucas, and Prescott textbook

### **2. Balanced-Growth Calibration and Basic Computational Methods**

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4. King, Robert G., Charles I. Plosser, and Sergio T. Rebelo. 1988. "Production, Growth, and Business Cycles I: The Basic Neoclassical Model." *Journal of Monetary Economics*, Vol. 21, p. 195-232.
5. King, Robert G., Charles I. Plosser, and Sergio T. Rebelo. 2002. "Production, Growth, and Business Cycles: Technical Appendix." *Computational Economics*, Vol. 20, p. 87-116.
6. Schmitt-Grohe, Stephanie and Martin Uribe. 2004. "Solving Dynamic General Equilibrium Models Using a Second-Order Approximation to the Policy Function." *Journal of Economic Dynamics and Control*, Vol. 28, p. 755-775.
7. Jaimovich, Nir and Sergio Rebelo. 2009. "Can News about the Future Drive the Business Cycle?" *American Economic Review*, Vol. 99, p. 1097-1118.
8. Bick Alexander, Nicola Fuchs-Schündeln, and David Lagakos. 2018. "How Do Average Hours Worked Vary with Income? Cross-Country Evidence and Implications." *American Economic Review*, Vol. 108, p. 170-199.
9. Boppart, Timo and Per Krusell. 2018. "Labor Supply in the Past, Present, and Future: a Balanced-Growth Perspective." Working Paper.

10. Uhlig, Harald. 1999. "A Toolkit for Analyzing Nonlinear Dynamic Stochastic Models Easily." In *Computational Methods for the Study of Dynamic Economies*, edited by Ramon Marimon and Andrew Scott. Oxford Press.
11. Baxter, Marianne and Robert G. King. 1999. "Measuring Business Cycles: Approximate Band-Pass Filters for Economic Time Series." *Review of Economics and Statistics*, Vol. 81, p. 575-593.
12. Christiano, Lawrence J. and Terry J. Fitzgerald. 2003. "The Band Pass Filter." *International Economic Review*, Vol. 44, p. 435-465.
13. Kaldor, Nicholas. 1957. "A Model of Economic Growth." *Economic Journal*, Vol. 67, p. 591-624.
14. Kuznets, Simon. 1973. "Modern Economic Growth: Findings and Reflections." *American Economic Review*, Vol. 63, p. 247-258.
15. Brock, William A. and Leonard J. Mirman. 1972. "Optimal Economic Growth and Uncertainty: The Discounted Case." *Journal of Economic Theory*, Vol. 4, p. 479-513.

## UNIT II: Macro-Labor

### 3. Macro-Labor I: Labor-Leisure Margin

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16. Rogerson, Richard. 1988. “Indivisible Labor, Lotteries and Equilibrium.” *Journal of Monetary Economics*, Vol. 21, p. 3-16.
17. Hansen, Gary D. 1985. “Indivisible Labor and the Business Cycle.” *Journal of Monetary Economics*, Vol. 16, p. 309-327.
18. Mulligan, Casey B. 2001. “Aggregate Implications of Indivisible Labor.” *B.E. Journal of Macroeconomics: Advances in Macroeconomics*, Vol. 1.
19. Cho, Jang-Ok and Thomas F. Cooley. 1994. “Employment and Hours Over the Business Cycle.” *Journal of Economic Dynamics and Control*, Vol. 18, p. 411-432.
20. Swanson, Eric. 2012. “Risk Aversion and the Labor Margin in Dynamic Equilibrium Models.” *American Economic Review*, Vol. 102, p. 1663-1691.
21. Chetty, Raj, Adam Guren, Day Manoli, and Andrea Weber. “Are Micro and Macro Labor Supply Elasticities Consistent? A Review of Evidence on the Intensive and Extensive Margins.” *American Economic Review Papers and Proceedings*, May 2011 p. 471-5.

### 4. Macro-Labor II: Employment-Unemployment Margin

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22. Pissarides, Christopher A. 2000. *Equilibrium Unemployment Theory*. MIT Press.
23. Shimer, Robert. 2010. *Labor Markets and Business Cycles*. Princeton University Press.
24. Rogerson, Richard and Robert Shimer. 2011. “Search in Macroeconomic Models of the Labor Market.” *Handbook of Labor Economics*, Elsevier.
25. Rogerson, Richard, Robert Shimer, and Randall Wright. 2005. “Search-Theoretic Models of the Labor Market: A Survey.” *Journal of Economic Literature*, Vol. 43, p. 959-988.
26. Shimer, Robert. 2004. “The Consequences of Rigid Wages in Search Models.” *Journal of the European Economic Association*, Vol. 2/3, p. 469-479.
27. Shimer, Robert. 2005. “The Cyclical Behavior of Equilibrium Unemployment and Vacancies.” *American Economic Review*, Vol. 95, p. 25-49.

28. Hall, Robert E. 2005. "Equilibrium Wage Stickiness." *American Economic Review*, Vol. 95, p. 50-65.
29. Hagedorn, Marcus and Iourii Manovskii. 2008. "The Cyclical Behavior of Equilibrium Unemployment and Vacancies Revisited." *American Economic Review*, Vol. 98, p. 1692-1706.
30. Hosios, Arthur J. 1990. "On the Efficiency of Matching and Related Models of Search and Unemployment." *Review of Economic Studies*, Vol. 57, p. 279-298.
31. Moen, Espen. 1997. "Competitive Search Equilibrium." *Journal of Political Economy*, Vol. 105, p. 385-411.
32. Stole, Lars A. and Jeffrey Zwiebel. 1996a. "Intra-firm Bargaining under Non-Binding Contracts." *Review of Economic Studies*, Vol. 63, p. 375-410.
33. Stole, Lars A. and Jeffrey Zwiebel. 1996b. "Organizational Design and Technology Choice Intra-firm Bargaining." *American Economic Review*, Vol. 83, p. 195-222.
34. Brugemann, Bjorn, Pieter Gautier, and Guido Menzio. 2018. "Intra-Firm Bargaining and Shapley Values." *Review of Economic Studies*, Forthcoming.
35. Pissarides, Christopher A. 1994. "Search Unemployment with On-the-Job Search." *Review of Economic Studies*, Vol. 61, p. 457-475.
36. Michael U. Krause and Thomas A. Lubik, 2006. "The Cyclical Upgrading of Labor and On-the-Job Search." *Labour Economics*, Vol. 13, p. 459-477.
37. Michael U. Krause and Thomas A. Lubik, 2010. "On-the-Job Search and the Cyclical Dynamics of the Labor Market." Federal Reserve Bank of Richmond Working Paper 10-12.
38. Acemoglu, Daron and William B. Hawkins. 2014. "Search with Multi-Worker Firms." *Theoretical Economics*, Vol. 9, p. 583-628.
39. Kudlyak, Marianna. 2014. "The Cyclicity of the User Cost of Labor." *Journal of Monetary Economics*, Vol. 68, p. 53-67.
40. Shimer, Robert. 2007. "Mismatch." *American Economic Review*, Vol. 97, p. 1074-1101.
41. Shimer, Robert. 2012. "Reassessing the Ins and Outs of Unemployment." *Review of Economic Dynamics*, Vol. 15, p. 127-148.
42. Shimer, Robert. 2012. "Wage Rigidity and Jobless Recoveries." *Journal of Monetary Economics*, Vol. 59, p. S65-S77.

43. Hall, Robert E. and Paul R. Milgrom. 2008. "The Limited Influence of Unemployment on the Wage Bargain." *American Economic Review*, Vol. 98, p. 1653-1674.
44. Hall, Robert E. 2009. "Reconciling Cyclical Movements in the Marginal Value of Time and the Marginal Product of Labor." *Journal of Political Economy*, Vol. 117, p. 281-323.
45. Chodorow-Reich, Gabriel and Loukas Karabarbounis. 2016. "The Cyclical Nature of the Opportunity Cost of Employment." *Journal of Political Economy*, Vol. 124, p. 1563-1618.
46. Hall, Robert E. 2017. "High Discounts and High Unemployment." *American Economic Review*, Vol. 107, p. 305-330.
47. Pissarides, Christopher A. 2009. "The Unemployment Volatility Puzzle: Is Wage Stickiness the Answer?" *Econometrica*, Vol. 77, p. 1339-1369.
48. Andolfatto, David. 1996. "Business Cycles and Labor Market Search." *American Economic Review*, Vol. 86, p. 112-132.
49. Merz, Monika. 1995. "Search in the Labor Market and the Real Business Cycle." *Journal of Monetary Economics*, Vol. 36, p. 269-300.
50. Mortensen, Dale and Christopher A. Pissarides. 1994. "Job Creation and Job Destruction in the Theory of Unemployment." *Review of Economic Studies*, Vol. 61, p. 397-415.
51. denHaan, Wouter J., Garey Ramey, and Joel Watson. 2000. "Job Destruction and Propagation of Shocks." *American Economic Review*, Vol. 90, p. 482-498.
52. Gertler, Mark and Antonella Trigari. 2009. "Unemployment Fluctuations with Staggered Nash Bargaining." *Journal of Political Economy*, Vol. 117, p. 38-86.
53. Davis, Steven J., R. Jason Faberman, and John C. Haltiwanger. 2013. "The Establishment-Level Behavior of Vacancies and Hiring." *Quarterly Journal of Economics*, Vol. 127, p. 581-622.
54. Barnichon, Regis and Andrew Figura. 2015. "Labor Market Heterogeneity and the Aggregate Matching Function." *American Economic Journal: Macroeconomics*, Vol. 7, p. 222-249.
55. Veracierto, Marcelo. 2008. "On the Cyclical Behavior of Employment, Unemployment, and Labor Force Participation." *Journal of Monetary Economics*, Vol. 55, p. 1143-1157.

56. Alvarez, Fernando and Robert Shimer. 2011. "Search and Rest Unemployment." *Econometrica*, Vol. 79, p. 75-122.
57. Ebrahimi, Ehsan and Robert Shimer. 2010. "Stock-Flow Matching." *Journal of Economic Theory*, Vol. 145, p. 1325-1353.
58. Lucas, Robert E. and Edward C. Prescott. 1974. "Equilibrium Search and Unemployment." *Journal of Economic Theory*, Vol. 7, p. 188-209.
59. Aguiar, Mark, Erik Hurst, and Loukas Karabarbounis. 2013. "Time Use During the Great Recession." *American Economic Review*, Vol. 103, p. 1664-1696.
60. Karabarbounis, Loukas. 2014. "The Labor Wedge: MRS vs. MPN." *Review of Economic Dynamics*, Vol. 17, p. 206-223.
61. Nakajima, Makoto. 2012. "Business Cycles in the Equilibrium Model of Labor Market Search and Self-Insurance." *International Economic Review*, Vol. 53, p. 399-431.
62. Krusell, Per, Toshihiko Mukoyama, and Aysegul Sahin. 2010. "Labor-Market Matching with Precautionary Savings and Aggregate Fluctuations." *Review of Economic Studies*, Vol. 77, p. 1477-1507.
63. Chugh, Sanjay K. and Christian Merkl. 2016. "Efficiency and Labor Market Dynamics in a Model of Labor Selection." *International Economic Review*, Vol. 57, p. 1371-1404.



## UNIT III: Intermediation in Labor Markets

### 5. Recruiting

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64. Rubenstein, Ariel and Asher Wolinsky. 1987. "Middlemen." *Quarterly Journal of Economics*, Vol. 102, p. 581-593.
65. Masters, Adrian. 2007. "Middlemen in Search Equilibrium." *International Economic Review*, Vol. 48, p. 343-362.
66. Wright, Randall and Yuet-Yee Wong. 2014. "Buyers, Sellers, and Middlemen: Variations on Search-Theoretic Themes." *International Economic Review*, Vol. 55, p. 375-397.
67. Nosal, Ed, Yuet-Yee Wong, and Randall Wright. 2015. "More on Middlemen: Equilibrium Entry and Efficiency in Intermediated Markets." *Journal of Money, Credit and Banking*, Vol. 47, pp. 7-37.
68. Wright, Randall, Philipp Kircher, Benoit Julien, and Veronica Guerrieri. 2017. "Directed Search: A Guided Tour." NBER working paper w23884.
69. Jarosch, Gregor, Maryam Farboodi, and Guido Menzio. 2017. "Intermediation as Rent Extraction." Working paper.
70. Farboodi, Maryam, Gregor Jarosch, and Robert Shimer. 2018. "The Emergence of Market Structure." Working paper.
71. Chugh, Sanjay K. and Alan Finkelstein Shapiro. 2018. "Monopolistically Competitive Search Equilibrium." Working paper.

## UNIT IV: Product Markets

### 6. Product Markets

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72. Diamond, Peter A. 1971. "A Model of Price Adjustment." *Journal of Economic Theory*, Vol. 3, p. 156-168.
73. Chamberlin, Edward. 1933. *The Theory of Monopolistic Competition*.
74. Robinson, Joan. 1933. *The Economics of Imperfect Competition*.
75. Dixit, Avinash K. and Joseph E. Stiglitz. 1977. "Monopolistic Competition and Optimum Product Diversity." *American Economic Review*, Vol. 67, p. 297-308.
76. Benassy, Jean-Pascal. 1996. "Taste for Variety and Optimum Production Patterns in Monopolistic Competition." *Economics Letters*, Vol. 52, p. 41-47.
77. Feenstra, Robert C. 2003. "A Homothetic Utility Function for Monopolistic Competition Models, Without Constant Price Elasticity." *Economics Letters*, Vol. 78, p. 79-86.
78. Comin, Diego and Mark Gertler. 2006. "Medium-Term Business Cycles." *American Economic Review*, Vol. 96, p. 523-551.
79. Bilbiie, Florin O., Fabio Ghironi, and Marc J. Melitz. 2012. "Endogenous Entry, Product Variety, and Business Cycles." *Journal of Political Economy*, Vol. 120, p. 304-345.
80. Saez, Emmanuel and Pascal Michaillet. 2015. "Aggregate Demand, Idle Time, and Unemployment." *Quarterly Journal of Economics*, Vol. 130, p. 507-569.
81. Gourio, Francois and Leena Rudanko. 2014. "Customer Capital." *Review of Economic Studies*, Vol. 81, p. 1102-11

## UNIT V: Optimal Fiscal Policy

### 7. Optimal Fiscal Policy: The Macro-Ramsey Approach

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82. Ramsey, Frank. 1927. "A Contribution to the Theory of Taxation." *Economic Journal*, Vol. 37, p. 47-61.
83. Stiglitz, Joseph E. 2014. "In Praise of Frank Ramsey's Contribution to the Theory of Taxation." NBER Working Paper 20530.
84. Economides, George, Apostolis Philippopoulos, and Vangelis Vassilatos. 2008. "The Primal vs. the Dual Approach to the Optimal Ramsey Tax Problem: A Note."
85. Lucas, Robert E. and Nancy L. Stokey. 1983. "Optimal Fiscal and Monetary Policy in an Economy Without Capital." *Journal of Monetary Economics*, Vol. 12, p. 55-93.
86. Chamley, Christophe. 1986. "The Welfare Cost of Capital Income Taxation in a Growing Economy." *Econometrica*, Vol. 54, p. 607-622.
87. Judd, Kenneth L. 1985. "Redistributive Taxation in a Simple Perfect Foresight Model." *Journal of Public Economics*, Vol. 28, p. 59-83.
88. Chari, V.V., Lawrence J. Christiano, and Patrick Kehoe. 1991. "Optimal Fiscal and Monetary Policy: Some Recent Results." *Journal of Money, Credit, and Banking*, Vol. 23, p. 519-539.
89. Chari, V.V. and Patrick J. Kehoe. 1999. "Optimal Fiscal and Monetary Policy." In *Handbook of Macroeconomics*, Vol. 1C, edited by John B. Taylor and Michael Woodford.
90. Schmitt-Grohe, Stephanie and Martin Uribe. 2004. "Optimal Fiscal and Monetary Policy Under Imperfect Competition." *Journal of Macroeconomics*, Vol. 26, p. 183-209.
91. Schmitt-Grohe, Stephanie and Martin Uribe. 2004. "Optimal Fiscal and Monetary Policy Under Sticky Prices." *Journal of Economic Theory*, Vol. 114, p. 198-230.
92. Siu, Henry E. 2004. "Optimal Fiscal and Monetary Policy with Sticky Prices." *Journal of Monetary Economics*, Vol. 51, p. 576-607.
93. Hagedorn, Marcus. 2010. "Ramsey Tax Cycles." *Review of Economic Studies*, Vol. 77, p. 1042-1071.
94. Chugh, Sanjay K. 2006. "Optimal Fiscal and Monetary Policy with Sticky Wages and Sticky Prices." *Review of Economic Dynamics*, Vol. 9, p. 683-714.

95. Chugh, Sanjay K. 2007. "Optimal Inflation Persistence: Ramsey Taxation with Capital and Habits." *Journal of Monetary Economics*, Vol. 54, p. 1809-1836.
96. Arseneau, David M. and Sanjay K. Chugh. 2008. "Optimal Fiscal and Monetary Policy with Costly Wage Bargaining." *Journal of Monetary Economics*, Vol. 55, p. 1401-1414.
97. Arseneau, David M. and Sanjay K. Chugh. 2012. "Tax Smoothing in Frictional Labor Markets." *Journal of Political Economy*, Vol. 120, p. 926-985.
98. Chugh, Sanjay K., Wolfgang Lechthaler, and Christian Merkl. 2018. "Optimal Fiscal Policy with Labor Selection." *Journal of Economic Dynamics and Control*, Vol. 94, p. 142-189.
99. Chugh, Sanjay K. and Fabio Ghironi. 2015. "Optimal Fiscal Policy with Endogenous Product Variety." CEPR Discussion Paper Series No. 10674.
100. Arseneau, David M., Ryan Chahrour, Sanjay K. Chugh, and Alan Finkelstein-Shapiro. 2015. "Optimal Fiscal and Monetary Policy in Customer Markets." *Journal of Money, Credit, and Banking*, Vol. 47, p. 617-672.