UNIVERSITY OF COLORADO BOULDER

Department of Economics

ECON7040: MACROECONOMIC THEORY II

Spring 2026

Instructor:	Alessandro Peri
Time:	MW 12:30-1:45PM
Location:	Econ 5
Phone:	(+1)3034927727
Email:	alessandro.peri@colorado.edu
Office Hours:	ECON 115, Friday, 11:15-12:45am
TAs:	Megan Rice, John Gorman

COURSE DESCRIPTION

This course introduces the students to the study of modern macroeconomics theory. The course focuses on both the theoretical and numerical analysis of general equilibrium dynamic model, with a particular focus on the neoclassical growth model.

The course starts with the study of dynamic programming. This part of the course focuses on the theoretical features of dynamic models. In this context, we study in great details the first five chapters of *Recursive Methods in Economic Dynamics*, by Stokey, Lucas and Prescott. Over the course, we use dynamic programming to study the neoclassical growth model. When possible (not very often), we will learn how to find a solution by hand. When not possible, we will rely on numerical methods.

The second section of the course, introduces frictions in a standard Real Business Cycle model: nominal rigidities (New-Keynesian model); search and matching frictions (Diamond-Mortensen-Pissarides model) and financial frictions (financial accelerator model). In this section, we will learn how to use Dynare to solve dynamic stochastic general equilibrium models.

The goal of the course is to develop the necessary skills to study and develop macroeconomics models, and to formulate answers to policy relevant questions.

COURSE ORGANIZATION

Lectures. We meet on Monday and Wednesday from 12:30 to 1:45PM in room Econ 5. **Our first class will be** on Monday, Jan 12th (see Spring 2026, first day of classes).

Office hours. Office hours will be held in my office (ECON 115) on Friday from 11:15 to 12:45pm. If this time is not convenient for you - due to some scheduling conflict - I will be happy to set up an appointment (subject to time availability). Office hours are by appointment only. Please, send me an email with a tentative 15-minute slots during office hours.

EVALUATION

Your final grade is determined as a weighted average among Midterm I (30%) and Final Exam (70%). **Midterm and final exam** are closed notes and books. No make-up tests will be given. **Problem sets** will be regularly assigned to cover the class material or explore other topics. You are required to work in group to complete the assignments. The group consists of 3/4 people that are formed in the first week of classes. Problem sets are submitted, one version per group as indicated in the Chronogram (see section below). Late assignments will not be accepted.

Assessment	Date	%
Midterm I	3/11/26	30%
Final Exam	Monday, April 27, 4:30-7pm	70%

TEXTBOOK AND LECTURE NOTES

Required Textbooks

- Nancy L. Stokey, Robert E. Lucas, Jr., and Edward C. Prescott, (1989) *Recursive Methods in Economic Dynamics*, Harvard University Press (SLP)

- Ljungqvist, Lars and Thomas J. Sargent, (2003), *Recursive Macroeconomic Theory*, Cambridge: MIT Press.

Optional Textbooks

- Corbae, D., Stinchcombe, M., & Zeman, J. (2009). An introduction to mathematical analysis for economic theory and econometrics. Princeton University Press.

Lecture Notes
In addition to a set of class handouts (AP), during the course we will also make use of the Lecture Notes by Nezih Guner (NG) and Pedro Gomes (PG).

COURSE OUTLINE

This section outlines the tentative schedule for the course.

INTRODUCTION TO DYNAMIC PROGRAMMING

- Convex Optimization Theory
- Finite-Horizon Dynamic Programming
  - Application: The life-cycle model
  - Code: Finite horizon one-sector growth model (Matlab)

  Readings: NG Ch 5.1.

- Jerome Adda, Russell Cooper, *Dynamic Economics: Quantitative Methods and Applications*

- One-Sector Growth Model
  - Lagrangian Approach for Solving Infinite Horizon Problems
  - Code: Computation of discrete one-sector growth model (Matlab)

Readings: NG Ch 5

DYNAMIC PROGRAMMING UNDER UNCERTAINTY

- Mathematical Preliminaries:
  - Markov chains and Transition functions
  - Convergence
- Markets
  - Arrow-Debreu Economy
  - Sequential Trading
  - Recursive Competitive Equilibrium
- Application:
  - Stochastic version of one-sector growth model
  - Asset Pricing
- Code: Implementation of Tauchen Method in Matlab and C.

Readings: LS Ch 2,12

- Mehra, R. and Prescott, E.C. *The Equity Premium: A puzzle*, Journal of Monetary Economics, 15, 145-161.

HETEROGENOUS AGENTS' MODEL AND AGGREGATION

- The Melitz (2003) Model
- CES Preferences

Readings:

- Melitz, M.J. (2003) *The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity.* Econometrica, 71, 1695-1725.

THE REAL BUSINESS CYCLE MODEL

- The Real Business Cycle Model
- Method of undetermined coefficients
- Calibration
- Code: Solution of an RBC model in Dynare

Readings:

- King, R. and S. Rebelo (2000), *Resuscitating Real Business Cycles*, in Taylor and Woodford, Handbook of Macroeconomics, 1B, 931-42
- Rebelo, S. (2005), *Real business cycle models: Past, present, and future?*, Scandinavian Journal of Economics, 107(2), 217-238
- Stock, J. and M. Watson (2000), *Business Cycle Fluctuations in U.S. Macroeconomic Time Series*, in J. Taylor and M. Woodford eds., Handbook of Macroeconomics, 1A, 3-64
- Chari, V., Kehoe, P. McGrattan, E. (2007), *Business cycle accounting* Econometrica, 3(5)
- Kydland, F. and E.C. Prescott (1990), *Business Cycles: Real Facts and a Monetary Myth*, Quartely Review, Federal Reserve Bank of Minneapolis

MONEY, NOMINAL FRICTIONS AND MONETARY POLICY

- The New Keynesian (NK) Model
- Code: Solution of an NK Model in Dynare

Readings:

- Gali, J. (2008), *Monetary Policy, Inflation and the Business Cycle*, Princeton University Press, Chapters 2, 3 and 4.
- Christiano, L., M. Eichenbaum, and C. Evans (1998), *Monetary Policy Shocks: What Have We Learned and to What End?*, in J.B. Taylor, and M. Woodford eds., Handbook of Macroeconomics, 1A, 65-148.
- Clarida, R., J. Gali and M. Gertler (1999) *The Science of Monetary Policy: A New-Keynesian Perspective*, Journal of Economic Literature, 37, 1661-1707.
- McCandless, G. and W. Weber (1995) *Some Monetary Facts*, Federal Reserve Bank of Minneapolis, Quarterly Review.
- Smets, F. and R. Wouters (2007) *Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach*, American Economic Review, 97(3), 586-606.

CHRONOGRAM

Our first class will be on Monday, Jan 12th from 12:30-1:45PM. This is the tentative schedule.

Monday	Wednesday
Jan 12th **1** **Instructions in Homework 0** Introduction to Dynamic Programming	14th **2** Introduction to Dynamic Programming
19th **Martin Luther King Jr. Holiday** (No Classes; University Closed)	21st **3** **Hand In Homework 1** Introduction to Dynamic Programming
26th **4** Introduction to Dynamic Programming	28th **5** Introduction to Dynamic Programming
Feb 2nd **6** Introduction to Dynamic Programming	4th **7** Introduction to Dynamic Programming
9th **8** Introduction to Dynamic Programming	11th **9** **Hand In Homework 2** Dynamic Programming Under Certainty
16th **10** Dynamic Programming Under Certainty	18th **11** Blackwell Sufficient Conditions + Correspondences
23rd **12** Correspondences + Berge's Maximum Theorem	25th **13** Berge's Maximum Theorem Proof on Board
Mar 2nd **14** Optimality SP then FE and FE then SP	4th **15** **Hand In Homework 3** Dynamic Programming Under Certainty
9th **16** Dynamic Programming Under Certainty	11th **17** **Midterm I** Stochastic Dynamic Programming
16th **Spring Break** (No Classes)	18th **Spring Break** (No Classes)

Monday		Wednesday	
23rd	**18**	25th **Hand In Homework 4** Stochastic Dynamic Programming	**19**
30th Stochastic Dynamic Programming	**20**	Apr 1st Heterogenous Agents Models	**21**
6th Heterogenous Agents Models	**22**	8th Heterogenous Agents Models	**23**
13th RBC	**24**	15th **Hand In Homework 5** RBC	**25**
20th New Keynesian Model	**26**	22nd New Keynesian Model	**27**

UNIVERSITY POLICIES

You should familiarize yourself with the following University of Colorado policies.

CLASSROOM BEHAVIOR

Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, marital status, political affiliation, or political philosophy. For more information, see the Student Classroom and Course-Related Behavior Policy, Student Code of Conduct, Office of Institutional Equity and Compliance.

ACCOMMODATION FOR DISABILITIES, TEMPORARY MEDICAL CONDITIONS, AND MEDICAL ISOLATION

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see Temporary Medical Conditions on the Disability Services website.

If you have a required medical isolation for which you require adjustment, reach out to your TA via email. In compliance with the FERPA privacy protection, there is no need need for you to state the nature of your illness or require a doctor note (campus health services no longer provide "doctor's notes" or appointment verifications).

PREFERRED STUDENT NAMES AND PRONOUNS

CU Boulder recognizes that students' legal information does not always align with how they identify. If you wish to have your preferred name (rather than your legal name) and/or your preferred pronouns appear on your instructors? class rosters and in Canvas, visit the Registrar's website for instructions on how to change your personal information in university systems. In the absence of such updates, the name that appears on the class roster is the student's legal name.

HONOR CODE

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: studentconduct@colorado.edu, 303-492-5550. Students found responsible for violating the Honor Code will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit Honor Code for more information on the academic integrity policy.

SEXUAL MISCONDUCT, DISCRIMINATION, HARASSMENT AND/OR RELATED RETALIATION

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits protected-class discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner abuse (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email OIEC@colorado.edu. Information about university policies, reporting options, and OIEC support resources including confidential services can be found on the OIEC website.

Please know that faculty and graduate instructors are required to inform OIEC when they are made aware of incidents related to these concerns regardless of when or where something occurred. This is to ensure the person impacted receives outreach from OIEC about resolution options and support resources. To learn more about reporting and support a variety of concerns, visit the Don't Ignore It page.

ACCOMMODATION FOR RELIGIOUS ACCOMMODATIONS

Campus policy requires faculty to provide reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please communicate the need for a religious accommodation in a timely manner, and **no later than the end of the second week of classes**. See the campus policy regarding religious observances for full details.

MENTAL HEALTH AND WELLNESS

The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact Counseling and Psychiatric Services (CAPS), located in C4C, or call (303) 492-2277, 24/7.