Overview
This course is broadly about the long-run macroeconomic phenomena. We will focus on building and analyzing dynamic general equilibrium growth models with no uncertainty. Particular attention will be paid to the correspondence between the models and the commonly used macroeconomic data. We will consider applications related to cross-country income differences, pricing of capital assets and some aspects of fiscal policy. The basic dynamic macroeconomic model will be further extended to illustrate various methods of incorporating technological change in a general equilibrium setting.

Course requirement
Every week, you will receive a problem set corresponding to the material covered in this week (10 problem sets in all). Your grade for the course will be based on the midterm exam (50%) and the final exam (50%). Problem sets are to be handed in to the GSI on the due date (which is either in class or in section meeting). Each problem will be graded on “Mostly done”, “Partially done”, “Mostly not done” scale. Although problem sets do not factor in your grade, they give you valuable feedback about your progress in the course.

Class meetings for lectures: Mondays and Wednesdays 10:10-11:30 am 173 Lorch
Discussion section: Tuesdays 4:10 pm – 5:30 pm, 373 Lorch

Midterm exam: Wednesday, October 15, 10:10-11:30 am, 173 Lorch
Final Exam: Monday, December 15, 4:00 pm (sharp) - 6:00 pm, 173 Lorch

Office hours

<table>
<thead>
<tr>
<th>Dmitriy Stolyarov (<a href="mailto:stolyar@umich.edu">stolyar@umich.edu</a>)</th>
<th>Mondays 11:45 am – 12:45 pm, Fridays 2 pm – 3 pm</th>
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<tbody>
<tr>
<td>Fudong Zhang (<a href="mailto:fudongzh@umich.edu">fudongzh@umich.edu</a>)</td>
<td>Wednesdays 11:30-1:00, Thursdays 4:30-6:00</td>
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Course outline

1. Solow growth model
   Basics; Discrete and continuous time; competitive equilibrium; Transitional dynamics; Convergence; comparative dynamics; Golden rule

   Acemoglu 2.1-2.5
   Romer 1.2-1.5
   Barro 1.2

   Solow model with technological progress; Balanced growth path; Uzawa theorem

   Acemoglu 2.7

2. Solow model and the data
   National Income and Product Accounts; Growth accounting; Solow model and cross-country growth facts; Calibrating productivity differences

   Acemoglu 3
   Romer 1.6-1.7, 3.8-3.9
   Barro 10.1-10.3


3. Vintage capital model
   Solow vintage capital model; Jorgensen’s formula; Investment-specific technological change


   Raouf Boucekkine, David de la Croix, Omar Licandro “Vintage capital growth theory: Three breakthroughs”


4. The Neoclassical Growth model
Continuous time optimal control; systems of two first-order autonomous differential equations; Ramsey-Cass-Koopmans optimal growth model; Phase diagram analysis;

Acemoglu 8
Romer Ch 2A
Barro Chapter 2.1-2.6, Appendix on Mathematical Methods

Representative agent interpretation of the Ramsey model. Applications to fiscal policy

Acemoglu 5, 8
Romer Ch 2A, 11
Barro Chapter 2, 3.1


Discrete-time neoclassical growth model with labor-leisure choice; Log-linearization of first order conditions; Response to temporary and permanent productivity shock; Calibration to the balanced growth path of the US economy.

Acemoglu 8
Romer 4

5. Overlapping generations model.
The role of Social Security and government debt

Acemoglu 9
Romer, Ch 2B
Barro, 3.8


6. Endogenous technological change.

Acemoglu 10, 11.4, 13
Romer, Chapter 3
Barro and Sala-i-Martin 5, 6