



Syllabus for ECON 490:  
**BUSINESS CYCLES AND ECONOMIC GROWTH**

University of Illinois at Urbana-Champaign  
Department of Economics

Spring 2018

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**Office hours.** Thursdays from 1.45 PM - 3.15 PM in DKH 18B (basement).

### **Schedule**

We will meet for classes biweekly on Tuesday and Thursday from 3.30 PM - 4.50 PM in DKH 215B.

### **Course description**

This is an advanced course in macroeconomics that discusses the frameworks used to understand short-run fluctuations (business cycles) and long-run economic growth. The models are then evaluated to see how they square with the data focusing on the U.S. economy in particular. The objective of this course is to provide students with a solid foundation in rigorous economic modeling and the analysis of macroeconomic data so that they can understand and independently analyze various macroeconomic phenomena. To do so, this course will cover neoclassical and modern theories of economic growth and discuss several views of the business cycle ranging from new classical to New Keynesian economics.

## Prerequisites

ECON 302, 303, 202 and basic knowledge of Microsoft Excel. ECON 203 and basic knowledge of statistical packages such as Stata or MATLAB is recommended.

## Evaluation

This course provides **3** credit hours. Your grade will be determined by 7 problem sets (**30%**), a midterm (**30%**) and a final exam (**40%**). The worst problem set in terms of grade can be dropped. Problem sets are generally due at the beginning of a class. Solutions will typically be posted on Illinois Compass after a class. Late submissions will *not* be accepted and will automatically receive a zero score. Illegible writing will be ignored and the resulting work will be treated as incomplete. Typewritten answers are preferred but not compulsory. These assignments require careful thinking, so I encourage you to work in groups. You can hand in your *stapled, hardcopy* problem sets in groups of at most three students.

The date of the midterm and final exam will be announced at a later stage. In case of a missed exam, students must present a letter from the Office of the Dean justifying their absence, otherwise the student will receive a zero on the missed exam. There are *no* make-up exams.

## Reading material and recommended textbooks

The course's main source of material consists of the slides and lecture notes. These will always be posted before the beginning of every lecture on Illinois Compass. While the slides provide a thorough treatment of the material, I will provide more intuition and graphical illustrations in class which will greatly increase your understanding. Therefore, I strongly encourage you to attend every class. There is no required textbook, however the course's materials are roughly based on chapters from the following textbooks.

- ▷ Jones, C. I. and D. Vollrath, *Introduction to Economic Growth* (3rd edition), W. W. Norton & Company, 2013.
- ▷ Barro, R. J., *Macroeconomics* (5th edition), MIT Press, 1997 ("Barro").
- ▷ Doepke, M., Lehnert, A. and A. W. Sellgren, *Macroeconomics*, 1998.

The relevant chapters from Doepke *et al.* (1998) will be distributed electronically on Illinois Compass. The textbook by Jones and Vollrath (2013) contains an excellent overview of the first half of the course. While we somewhat follow the textbook by Doepke *et al.* (1998), you may find it useful to read Barro (1997) to understand the context and intuition behind the formal models we cover. Additional and supplementary readings, if any, will be provided on Illinois Compass.

## Tentative course outline

### MEASUREMENT AND FACTS ON ECONOMIC GROWTH (1 week)

We start the course with how aggregate variables are typically measured and treated by economists in the national accounts. In particular, you will be introduced to statistics from the Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS) and Federal Reserve Economic Database (FRED).

**National accounting.** National income and product accounts (NIPA), measurement of gross domestic product (GDP), value added, gross output.

**Macroeconomic measurement.** Real versus nominal variables, price indices (CPI and PPI), long term trends and short term fluctuations, representative agent and firm.

**Empirical features of U.S. economic growth.** Growth accounting, Kaldor facts on economic growth.

### INTRATEMPORAL AND INTERTEMPORAL TRADE-OFFS (1 week)

Before diving into the analysis of macroeconomic frameworks, we will refresh some basics on consumer behavior that are often at the heart of modern models of macroeconomics.

**Consumption and leisure.** Marginal rate of substitution, Inada conditions.

**Intertemporal consumption.** Savings, marginal rate of transformation, Euler equation, life-time budget constraint, Lucas tree.

### NEOCLASSICAL GROWTH (4 weeks)

In these weeks, we will focus on what makes countries grow in the long run. In particular, we will cover neoclassical theories of economic growth in which technology plays a central role.

**Solow-Swan model.** Exponential population growth, exogenous growth with fixed savings rate, golden rule.

**Neoclassical growth model.** Exogenous growth with endogenous savings rate.

### MODERN ECONOMIC GROWTH (3 weeks)

After learning about the classical theories, we will highlight their shortcomings and what we can do to address these. The answer to these questions lie in theories of endogenous growth. To introduce you to modern theories of economic growth, we will look at models in which innovation is the key determinant for an economy's long-run growth.

**Ideas.** Technology, economics of ideas, intellectual property rights, patents.

**Endogenous growth.**  $Ak$  model of growth without diminishing returns, expanding product varieties model, Schumpeterian growth.

### FACTS ON BUSINESS CYCLES (1 week)

In the second part of the course, we switch gears and focus on short-run fluctuations of the economy. We start by looking at data for the U.S. economy and see how business cycles are measured. Then, we will look at the historical up-and-down patterns of the U.S. economy.

**Empirical features of U.S. business cycle.** Cyclical, detrending.

### REAL BUSINESS CYCLE (RBC) MODEL (3 weeks)

After looking at the data, we will construct a model that can explain the basic patterns of observed short-run movements for the U.S. economy. In particular, we build upon the neoclassical growth model to do so.

**Time series.** Persistence, autoregressive process, amplification.

**RBC models.** Simplified version, social planner and decentralized economy, simulation.

### NEW KEYNESIAN (NK) MODEL (3 weeks)

In the last part of the course, we will try to address some criticisms on the RBC model. To do so, we will look at some New Keynesian models. New Keynesian economists use some features of RBC models, but make a few different, yet crucial, assumptions. Our goal is to understand what these assumptions are and how they deliver drastically different results and policy implications compared to the RBC model.

**Market failures.** Imperfect competition, sticky prices.

**NK models.** Simplified version, log-linearized model, simulation, policy implications.

### Final exam conflicts

We abide by the University's final exam policy which can be found [here](#). Pay particular attention to the following items:

- Any student having more than two consecutive final examinations is entitled to rescheduling as follows if he or she takes the following action no later than the last day of classes:
  - The student must investigate whether a conflict examination is being held at another time for any of the examinations involved.
  - If a conflict examination has been scheduled for any of the courses, the student must take one or more of these conflict examinations. If conflict examinations are offered for more than one course, the student must take the conflict for the course that has the largest number of students.
  - If no conflict examinations have been scheduled, the student must contact the instructor of the course having the largest number of students. The contact must be made no later than the last day of classes, and that instructor must provide a makeup examination.
  - Normally in a semester several combined-sections, conflict, and noncombined examinations are given at the same time. As a guide to resolving conflicts, an order of priority has been

established within each examination period, and a student should resolve a conflict using the published examination schedules and the following priority guidelines.

- National and state professional examinations (e.g., CPA, actuarial science, Architecture Registration Examination) take priority over campus final examinations. An instructor must offer a conflict examination to a student scheduled to take a national or state professional examination and a campus final examination at the same time.
- A noncombined course examination has precedence over any combined-sections or conflict examination.
- A department offering a combined-sections final examination must provide a conflict examination if required to accommodate student conflicts.

### Accommodations for disability reasons

The University is committed to providing reasonable accommodations for all persons with disabilities. To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources Educational Services (DRES) as soon as possible. To contact DRES, visit them in person at 1207 S. Oak Street, Champaign, call at (217) 333-4603 (V/TTY) or send a message to [disability@uiuc.edu](mailto:disability@uiuc.edu).

### Academic integrity

We abide by the University's full academic integrity policy which can be found [here](#). In particular, note the following:

“The University has the responsibility for maintaining academic integrity so as to protect the quality of education and research on our campus and to protect those who depend upon our integrity.

EXPECTATION OF STUDENTS. It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Students have been given notice of this Part by virtue of its publication. Regardless of whether a student has actually read this Part, a student is charged with knowledge of it. Ignorance is not a defense.”

I will assume for this course that you will adhere to the academic creed of this University and will maintain the highest standards of academic integrity. Put simply: any form of cheating on either the homework assignments or exams may result in an immediate “Fail” for the course and will be reported for further disciplinary action.