Economics of Growth and Innovation

Spring 2023 Syllabus

CLASS INFORMATION
Course: ECON 4430/6130
Lectures: TF 2:00 - 3:50PM
Location: Voorhees North

INSTRUCTOR INFORMATION
Instructor: Michael A. Klein
Email: kleinm5@rpi.edu
Office: Sage 3206
OH: W 10:30AM-12:30PM

General Information

COURSE DESCRIPTION

This course introduces core topics in the study of economic growth. We develop the dynamic theoretical models that comprise the modern framework for understanding national and international growth. We examine the endogenous determinants of technological innovation and evaluate the institutions and policies that affect growth. Examples include education policy, infrastructure, judicial systems, and variations in intellectual property rights. We explore the growth consequences of an increasingly interconnected global economy. Related topics include international regulations, technology diffusion, economic development, and multinational firms. Theories of growth are critically examined against empirical fact.

LEARNING OUTCOMES

During the successful completion of this course, students will:

- Demonstrate knowledge of fundamental concepts in economic growth
- Develop an ability to model the forces behind economic growth in a structured mathematical framework
- Apply economic growth theory to understand real world economic dynamics
- Evaluate the performance of growth theory against empirical fact

PREREQUISITES

ECON 2020, MATH 2010 or equivalent, or permission of instructor.

TEXTBOOK

There is not a required textbook in this class. Students interested in additional resources may find the textbooks below useful.

- *Introduction to Economic Growth* (Third Edition) by Charles I. Jones and Dietrich Vollrath. Norton, 2013. (Undergraduate level)

- *Economic Growth* (Second Addition) by Robert J. Barro and Xavier Sala-i-Martin. MIT Press, 2004. (Graduate level)

Course Components

LECTURE

Class time will be used primarily for lecture, exercises and discussion. **All core material will be presented in lecture.** For each topic we cover, I will post corresponding typeset lecture notes to LMS and may post additional readings. Please note that reviewing posted lecture notes is not a substitute for attending lecture.

CLASS WEBPAGE

We will use RPI's Learning Management System (LMS) as our class webpage. All announcements, assignments, and resources will be posted to LMS. You are expected to have access to our LMS page, and check it regularly.

PROBLEM SETS (15% of grade)

Problem sets will accompany our main topics. I will post solutions to each problem set after the due date. I encourage working through assignments in groups, but all solutions must be written and submitted individually. I expect submitted problem sets to be legible and clear. Problem sets are graded on a completion basis only. Submitted problem sets must show a good faith effort to answer all questions to receive credit. Late submissions will not be accepted.

IN-CLASS EXERCISES (15% of grade)

We will occasionally pause lecture to work on practice exercises. Students will submit their individual work at the end of an exercise. In-class work is graded on a completion basis only. All students drop their lowest exercise score (e.g. due to unexcused absence).

REPORTS (20% of grade)

Students will write two brief reports on published academic papers selected from approved lists. The first topic will be empirical evaluations of the performance of neoclassical growth theory, and the second will be the frontier of endogenous growth theory. This exercise is designed to familiarize students with reading academic publications in economics and thinking critically about the state of economic growth theory.

EXAMS (50% of grade)

There will be two exams of equal weight (25% of grade each) over the course of the semester. Exams will be in-person, closed book exams. I will give at least two weeks notice prior to an exam date.

(6000 STUDENTS ONLY) PAPER: ANALYSIS OF A TOPIC OR POLICY ISSUE

Students enrolled in ECON 6130 will select a single topic or policy related to economic growth/innovation to explore in a written paper. The paper will include a description of the chosen topic using the language of economics, a synthesis of existing discussion/debate, and your original critical evaluation of the topic. There are two components to this assignment:

1. An outline of your paper that includes a list of references (due about half way through the semester)
2. Your final paper (due at the end of the semester)

This paper is worth 33% of the overall course grade for 6000 students. All other graded portions of the course are collectively given 67% total weight in the calculation of grades for 6000 students.

Graded Components

Components	% of Total (ECON 4430 students)	% of Total (ECON 6130 students)
Problem sets	15%	$(\frac{2}{3})$ x 15%
In-class exercises	15%	$(\frac{2}{3})$ x 15%
Reports	20%	$(\frac{2}{3})$ x 20%
Exams	50%	$(\frac{2}{3})$ x 50%
Paper	–	33%

Grade Scale

Grade	% Range								
–	–	B+	87 - 89	C+	77 - 79	D+	67 - 69	F	<55
A	93 - 100	B	83 - 86	C	73 - 76	D	55 - 66		
A-	90 - 92	B-	80 - 82	C-	70 - 72				

Important Miscellaneous

DISABILITY SERVICES

Rensselaer Polytechnic Institute strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on a disability, please let me know immediately so that we can discuss your options. To establish reasonable accommodations, please register with The Office of Disability Services for Students. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. DSS contact information: dss@rpi.edu; 518-276-819; 4226 Academy Hall.

ACADEMIC INTEGRITY

Student-teacher relationships are built on trust. For example, students must trust that teachers have made appropriate decisions about the structure and content of the courses they teach, and teachers must trust that the assignments that students turn in are their own. Acts that violate this trust undermine the educational process. The Rensselaer Handbook of Student Rights and Responsibilities and The Graduate Student Supplement define various forms of Academic Dishonesty and you should make yourself familiar with these. In this class, all assignments that are turned in for a grade must represent the student?s own work. In cases where help was received, or teamwork was allowed, a notation on the assignment should indicate your collaboration.

Violations of academic integrity may also be reported to the appropriate Dean (Dean of Students for undergraduate students or the Dean of Graduate Education for graduate students, respectively).

If you have any question concerning this policy before submitting an assignment, please ask for clarification. In addition, you can visit the following site for more information on our Academic Integrity Policy: Students Rights, Responsibilities, and Judicial Affairs.

Course Outline

1. Neoclassical Model of Growth
    - Solow-Swan Model
    - Extensions to Solow-Swan
    - Consumer Optimization
2. Empirical Applications of the Neoclassical Model
    - Regression Analysis
    - Convergence
    - Growth Accounting
    - (Exam 1)
3. Endogenous Growth
    - Learning by Doing
    - Modeling Technical Change
    - Quality Ladders
    - Empirical Applications
4. Growth in the Global Economy
    - Role of Multinational Firms
    - Modeling Technology Diffusion
    - International Regulation
    - Issues and Extensions
    - (Exam 2)