

ECON 483: Economics of Innovation and Technology

University of Illinois at Urbana-Champaign
College of Liberal Arts & Sciences
Department of Economics

Jorge Lemus

ONLINE - Synchronous

Spring 2021

Tuesday and Thursday: 9:30AM - 10:50AM

Communication:

E-mail: jalemus@illinois.edu

Office Hours: Friday 10:30am-11:30am. Appointment by email required.

Catalog Description:

Examines the economic factors shaping innovation and technical change since the industrial revolution with emphasis on the economic relationship between science and technology and the role of government in technical change.

Credit: 3 undergraduate hours. 2 or 4 graduate hours.

Prerequisite: [ECON 102](#) or equivalent; [ECON 302](#) or consent of instructor.

Course Description:

This course analyzes economics incentives to innovate and create new technology. Starting from the impact of institutions on innovation, the course then focuses on how market power, rewards to innovation, spillovers, and network effects, impact the intensity and direction of inventive activity. Throughout the course, students will be presented with theoretical models and empirical evidence to explore the economic incentives of innovators. The primary tool to analyze firms, consumers and government behavior is game theory. Knowing basic tools from calculus and statistics is required for the class. It is recommended for registered students to be familiar game theory (Nash equilibrium, Subgame Perfect equilibrium). We will devote a couple of lectures to review the basic game-theory concepts, which we will then apply to study strategic interactions in markets for innovation and technology.

References (Optional):

There is no required textbook. Two good references to complement the class lectures are:

The Theory of Industrial Organization. Jean Tirole. MIT Press (1988)

Innovation and Incentives. Suzanne Scotchmer, MIT Press (2006)

Evaluations:

- (20%) Class participation
- (20%) Group Homework – Up to 4 students per group
- (20%) Individual Analysis of an Innovation Issue
- (40%) Group Final Report and Presentation of an Innovation Topic

Class participation refers to contributions during a lecture, including questions, comments, and analysis of selected readings. The goal of the Group Homework is to evaluate the most technical aspects of the course. Instead of an in-class Midterm exam, we will have an individual analysis of an innovation issue, following specific guidelines on what to answer. Most of the grade for this class will be based on a report and (short) presentation of an innovation/technology topic of your choice. I suggest reading the newspapers, magazines, innovation blogs, etc. Apart from documenting facts, you must be able to **identify an underlying economic problem** and **present an economic analysis** using the tools learned in class.

The maximum score of each evaluation will be 100 points. To calculate your final score, first compute the weighted average of your evaluations,

$$\text{Final Score} = 0.2 * (\text{Class Participation}) + 0.2 * (\text{Group Homework}) + 0.2 * (\text{Individual Report 1}) + 0.4 * (\text{Final Report and Presentation})$$

To find your letter grade, compare that final score to the Plus/Minus Grade Cutoffs below:

Plus/Minus Grade Cutoffs

A+ ≥ 97	90 > B+ ≥ 87	C+ ≥ 77	D+ ≥ 67	60 > F
97 > A ≥ 93	87 > B ≥ 83	77 > C ≥ 73	67 > D ≥ 63	
93 > A- ≥ 90	83 > B- ≥ 80	73 > C- ≥ 70	63 > D- ≥ 60	

Academic Integrity:

“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.

Expectations 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.”

The University's full academic integrity policy is available at:
http://studentcode.illinois.edu/article1_part4_1-401.html

Final Exam Conflict Policy:

From the University's final exam policy:

- 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.

The University's final exam policy is available at:
http://studentcode.illinois.edu/article3_part2_3-201.html

Drop without a grade:

Check the Official Academic Calendar posted by the University.

Emergency Response Recommendations:

The university maintains guidelines for emergency responses. A list of recommendations when to evacuate and when to find shelter are available at:

http://illinois.edu/cms/2251/general_emergency_response_recommendations_8_16_13_final.docx

Floor plans for specific buildings are available at:

<http://police.illinois.edu/emergencyplanning/floorplans/>

Statement on Accommodations:

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 you may visit 1207 S. Oak Street, Champaign, call 333-4603 (V/TTY), or email a message to disability@uiuc.edu.

Topics:

1. Introduction: Innovation and Technological Advances

What is technology and innovation?

2. Historical Developments and Institutions

Why are we in the technological stage we are?

3. Innovation and Economic Growth

Why does innovation matter?

4. Ideas, Knowledge, and Intellectual Property

The economics of Ideas and problems of appropriation
(Patents; copyrights; open source; trade secrets, trademarks)

5. Optimal Design of Innovation Policies

How long should a patent last?

6. Litigation and Enforcement

How can firms enforce their IP? Strategic enforcement of patents. Patent trolls.

7. Innovation and Market Power

Do firms need market power to innovate?

8. Innovation and Market Structure

Does more competition encourage or discourage innovation?

9. Strategic Investment in R&D

Patent races; Strategic management of innovation.

10. Cumulative Innovations

How does the cumulative nature of technology affect incentives to innovate?

11. Knowledge Spillovers

If a firm R&D investment benefit rivals, how do incentives to innovate change?

12. Licensing and Joint Ventures

What to do with an invention? When do firms prefer collaboration over competition?

13. Technology Adoption and Technology Diffusion

Who adopts new technology? How does technology diffuse? Network Externalities