ECON 483: Economics of Innovation and Technology

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

Instructor: Jorge Lemus Fall 2025
Location: 1020 Wymer Hall
Day/Time: Monday and Wednesday, 11:00AM - 12:20AM

Communication:

E-mail: jalemus@illinois.edu
Office Hours: 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 examines the economic incentives that drive innovation and the creation of new technologies. Beginning with the impact of institutions on innovation, the course explores how factors such as market power, rewards for innovation, spillovers, and network effects influence the intensity and direction of inventive activity. Students will engage with theoretical models and empirical evidence to understand the economic motivations of innovators. The primary analytical tool is game theory, which will be used to analyze the behavior of firms, consumers, and governments. A basic understanding of calculus and statistics is required. Familiarity with game theory concepts, including Nash equilibrium and Subgame Perfect equilibrium, is recommended. The course includes a couple of lectures reviewing these foundational concepts, which will then be applied to study strategic interactions in markets for innovation and technology.

References (Optional):
There is no required textbook. Two good references to complement the lectures are:

Jean Tirole. *The Theory of Industrial Organization,* MIT Press (1988)
Suzanne Scotchmer. *Innovation and Incentives*, MIT Press (2006)

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

Evaluations:

Class participation

- Before each lecture, I will post readings on Canvas.
- Documents labelled *Participation Reading* will be evaluated.[1]
    - A student summarizes the reading for the class in 2 minutes.
    - A few follow-up questions will be discussed by the rest of the class.
- Students are **expected to read and prepare** for each lecture.
- Students summarizing the readings will be awarded **10 participation points**.
- **During** each lecture, each student can submit a *question* related to the lecture.
- These questions are worth **1 point per lecture**.

Homework

Homework assignments evaluate the **most technical aspects** of the course. You are encouraged to work in groups. Homework is not graded. However, you must understand how to **solve** the analytical problems, as similar questions will appear on the midterm.

Midterm Exams

The Midterm exams typically consist of two parts, one qualitative and one quantitative. In the first part, you will qualitatively analyze questions related to innovation issues. In this part, you need to use the concepts learned in the course to answer specific questions related to the topic. In the second part, you will solve analytical problems of the same level of difficulty of those problems in the homework assignments.

Final Project (Presentation of an Innovation Topic)

There will be a final group project instead of a final exam. You group will investigate an innovation topic throughout the semester and present your results in class, during the last weeks of the courser. Apart from documenting facts, you must be able to **identify an underlying economic problem** and **present an economic analysis** using the tools learned during the course. The document "Guidelines Presentations" in Canvas contains detailed information on the scope and expectations of the final presentations.

[1]Documents labelled *Optional Reading* complement the lectures for students interested to delve deeper on some topics. They will not be evaluated.

Assignment	Times Offered	Points	Total Possible Points
Reading Summary	1	10	10
In-Class Participation	15	1	15
Midterm	2	20	40
Final Project	1	40	40
Total			**105**

Final Grade: Your letter grade corresponds to the final score according to the Plus/Minus Grade Cutoffs below:

A+ >=100, A (93–99), A- (90–92), B+ (87–89), B (83–86), B- (80–82), C+ (77–79), C (73–76), C- (70–72), D+ (67–69), D (65–66), D- (65-60), F (<60).

Course Expected Objectives and Value:

1. Understand key issues related to innovation and technological change; improve your ability to analyze and interpret news and current events related to innovation.

2. Develop analytical skills to evaluate the economic incentives driving innovation, with a focus on real-world applications.

3. Foster collaboration, teamwork, and practice your presentation skills.

Class Conduct & Procedures:

Each class will blend lectures on key issues with problem-solving exercises and interactive discussions. Regular and timely attendance is essential and will positively impact your grade. You will be assigned specific readings, so please come prepared by reading them in advance. This preparation will enhance our class discussions and help you engage more meaningfully. Active participation is crucial, as it contributes to your grade. Focus on contributing **thoughtful, well-reasoned points and asking constructive questions,**

rather than simply speaking up or providing "correct" answers. Your insights and engagement are what make our discussions valuable.

Academic Integrity:
"The University has the responsibility for maintaining academic integrity to protect the quality of education and research on our campus and to protect those who depend upon our integrity.

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 read this Part, a student is charged with knowledge of it. Ignorance is not a defense.

The student code, describing: Student Rights and Responsibilities, General Policies and Regulations, and Academic Policies and Regulations is here:
https://studentcode.illinois.edu/

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:
https://police.illinois.edu/em/planning/

https://police.illinois.edu/em/run-hide-fight/

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.