



Subject: EBGN Number: 320

Course Title: Economics and Technology

Section: A

Semester/year: Summer 2019

Instructor or Coordinator: Scott Houser

Contact information:

Office: 328 Engineering Hall

Office Phone: 303-384-2045

email: shouser@mines.edu

Office hours: MWF 7:30-8:30 AM, 11:30 AM -1:00 PM, and by appointment (please make an appointment if my posted office hours don't work for your schedule)

Class meeting days/times: MWF, 1:15 – 3:45 PM

Class meeting location: Engineering Hall 211

Canvas link: elearning.mines.edu

Instructional activity: 3 hours lecture 0 hours lab 3 semester hours

Course designation: Common Core Distributed Science or Engineering
 Major requirement Elective Other (H&SS elective)

Course description from Bulletin: The theoretical, empirical and policy aspects of the economics of technology and technological change. Topics include the economics of research and development, inventions and patenting, the Internet, e-commerce, and incentives for efficient implementation of technology. Prerequisite: EBGN201. 3 hours lecture; 3 semester hours.

Textbook and/or other required materials:

Required text: Christine Greenlaugh and Mark Rogers, *Innovation, Intellectual Property and Economic Growth*, Princeton University Press, 2010, ISBN 978-0-691-12799-5

Other required supplemental information: Additional required readings will be posted on Canvas.

Student learning outcomes: At the conclusion of the class students will...

1. Explain why knowledge, technology and innovation are subject to market failures;
2. List basic institutional aspects of intellectual property rights;
3. Explain how innovation is measured and create an innovation index;
4. Analyze the role of economic actors using the model of the national innovation system;
5. Discuss the economic incentives and disincentives created by intellectual property rights and use this framework to analyze the strategies of firms;
6. Use economic models to analyze the role of innovation in macroeconomic growth and economic development;
7. Discuss the effects of innovation on employment, wages and income inequality;
8. Use economic models to analyze technology and innovation policy;
9. Develop and present a detailed economic analysis of a particular innovation.

Brief list of topics covered:

1. What is innovation?
2. Intellectual property
3. Measurement of innovation
4. National innovation system
5. Innovation and firms
6. IPRs and firms
7. Diffusion and social returns
8. Growth models
9. Globalization
10. Wages and jobs
11. Micro and macro policy

Policy on academic integrity/misconduct: The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining and fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

The complete policy is [online](#).

Grading Procedures:

Grades will be based on reading responses, a research project and class participation. Other exercises may be assigned. Attendance is not required, but absences will have a negative effect on your participation score.

Reading responses will include answers to end of chapter questions in the textbook and answers to structured discussion questions for other readings. Reading responses must be submitted on Canvas before 7:00 AM on the day due. Low scores on at least 3 of the reading responses will be dropped. End of chapter questions in the textbook will be allocated as follows:

- Last name beginning with A-F: Answer the odd-numbered questions in odd-numbered chapters and even-numbered questions in even-numbered chapters
- Last name beginning with G-Z: Answer the even-numbered questions in odd-numbered chapters and odd-numbered questions in even-numbered chapters

Class participation includes small group discussion, class discussion, in-class exercises and other activities.

The research project will allow you to explore some economic aspect of technology in more detail. The research paper will be about 7 pages in length and will be due on Thursday, 6/22. In addition to the paper, you will be required to make an in-class presentation. A detailed description of the research project assignment is available on Canvas.

You are responsible for all class announcements, reading assignments and material discussed in class.

The course grades will be determined using the following weights and a standard 100 point scale with A: 92% and greater, A-: 90% to less than 92%, B+: 88% to less than 90%, B: 82% to less than 88%, B-: 80% to less than 82%, C+: 78% to less than 80%, C: 72% to less than 78%, C-: 70% to less than 72%, D+: 68% to less than 70%, D: 60% to less than 78%, F: less than 60%..

- | | |
|-----------------------|------------|
| • Reading responses | 40 percent |
| • Research project | 45 percent |
| • Class participation | 15 percent |

Coursework Return Policy: Coursework will be submitted on Canvas and will be graded within one week.

Absence Policy: Failure to attend class and to participate in group and class discussion will lower your grade. All students are advised to be familiar with CSM's policy regarding the make-up of work missed due to excused absences. This policy may be found in the Bulletin and [here](#). In short, documentation for an excused absence must be provided to the Office of the Associate Dean of Students who will then send notices of excused absence to the faculty. The method for providing this documentation is up to the Associate Dean of Students. In all cases of unexcused absences the faculty member has the right to deny the student the opportunity to make up all or part of the missed work. The Athletics Department issues excused absence notices for student athletes.

Homework: Reading responses must be submitted on Canvas before 11:00 AM on the due date. Late responses will be penalized 20% for every 12 hours past the time and date due.

Detailed Course Schedule: *NOTE: The schedule and assignments are subject to change. If you are absent from class, it is your responsibility to check on announcements made while you were absent. All announcements will be posted on Canvas. You should check regularly for changes to the schedule and course requirements.*

<i>Dates</i>	<i>Topic</i>	<i>Readings and reading responses</i>
5/13	<i>Course Overview</i> <i>Economics review</i>	
5/15	<i>What is innovation?</i>	<i>Greenhalgh and Rogers (G & R) chapter 1</i> <i>Matt Ridley, "The Myth of Basic Science" Wall Street Journal, 10/23/15</i>
	<i>Intellectual property</i>	<i>G & R chapter 2</i>
5/20	<i>Economic modeling of IPRs</i>	<i>Scherer, FM. 1972. "Nordhaus' Theory of Optimal Patent Life: A Geometric Reinterpretation," American Economic Review, 62(3): 422-427</i>
	<i>Measurement of innovation</i>	<i>G & R chapter 3</i> <i>World Intellectual Property Organization, "Global Innovation Index 2017"</i>
5/22	<i>National innovation system</i>	<i>G & R chapter 4</i>
	<i>R&D spending in the US and the world</i>	<i>National Science Board. 2018. "Research and Development: National Trends and International Comparisons" in "Science and Engineering Indicators 2018, National Science Foundation</i>
	<i>Innovation and firms</i>	<i>G & R chapter 5</i>
5/29	<i>Creative destruction</i>	<i>Joseph A. Schumpeter. 1950. "The process of creative destruction," in Capitalism, Socialism and Democracy (pp. 81-86), 3rd edition, Harper and Brothers</i>
	<i>Disruptive technologies</i>	<i>Joseph L. Bower and Clayton M. Christensen. 1995. "Disruptive Technologies: Catching the Wave" Harvard Business Review, Jan-Feb 1995</i>
6/3	<i>IPRs and firms</i>	<i>G & R chapter 6</i>
	<i>Patent strategy</i>	<i>Charles Duhigg and Steve Lohr, "The Patent, Used as Sword" The New York Times, 10/8/2012</i>
	<i>Diffusion and social returns</i>	<i>G & R chapter 7</i>
6/5	<i>Network goods and standards</i>	<i>Carl Shapiro and Hal Varian. 1998. "Networks and Positive Feedback." Information Rules: A Strategic Guide to the Network Economy. Harvard Business Review Press</i>
	<i>Growth models</i>	<i>G & R chapter 8</i>
	<i>Globalization</i>	<i>G & R chapter 9</i>

6/10	<i>International technology diffusion</i>	<i>Hobday, M. 2000. East Asian latecomer firms: learning the technology of electronics. World Development 23(7):1,171–93</i>
	<i>Wages and jobs</i>	<i>G & R chapter 10</i>
	<i>Innovation and employment</i>	<i>Adam Davidson. 2012. "Making it in America" The Atlantic, January/February</i>
6/12	<i>Student research presentations</i>	
6/17	<i>Micro policy</i>	<i>G & R chapter 11</i>
	<i>Macro policy</i>	<i>G & R chapter 12</i>
	<i>IPR reform</i>	<i>Boldrin, Michele, and David Levine. 2002. "The Case Against Intellectual Property." American Economic Review, 92(2): 209-212.</i>
6/19	<i>Wrap-up</i>	