Penn Engineering
EAS 5070: Intellectual Property Strategy and Business Law for Engineers
Fall 2024
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I. Instructor

Steven Weiner is Senior Director of Innovation & Technology for Penn Engineering, and a lecturer in Penn Engineering's Department of Electrical & Systems Engineering and in Wharton's Management Department. Previously, he was a partner with the law firm of Davis Polk where he led the firm's Corporate Intellectual Property practice; he has also held executive positions in the tech industry. Professor Weiner holds degrees from Harvard Law School, MIT, and the University of Pennsylvania.

Professor Weiner created this course by drawing on his extensive experience advising companies and stakeholders about strategic business decisions that require a deep understanding of intellectual property law, advanced technology, and business strategy.

II. Student Qualifications and Prerequisites

Strong interest in technology innovation is expected, but there is no need for deep expertise in any particular technical area to excel in this course. The course is designed especially for engineering students with entrepreneurial goals, but it will also be highly valuable to students who aspire to be technology developers, executives, advisers, and/or investors in innovation-driven industries.

III. Course Objectives and Overview

Announcing the first iPhone at Macworld 2007, Apple CEO Steve Jobs famously boasted: "And boy, have we patented it!" How, and to what extent, does intellectual property actually provide competitive advantage for innovative technology companies? What makes an IP asset strategically powerful? How do patents impact – and sometimes drive – major corporate decisions including M&A, venture funding and exits, and entry into new markets? In this course, students will learn to critically analyze and answer these questions, gaining insights they can leverage in their future roles as entrepreneurs, developers of innovative technology, executives, advisers, and/or investors.

To achieve these goals, the course is divided into three units:

- In Unit 1, ***Patents and Innovation Value*****,** we learn how to analyze the scope of protection provided by patents, and we examine closely how and when that form of protection translates to competitive advantage. We practice applying these concepts to critique and improve the patents that protect a company's most important innovations.
- In Unit 2, ***IP Leverage and the Corporate Playbook***, we learn transaction basics, and study theory and examples of how IP leverage strategically informs a variety of corporate transactions. We will examine the "contextual" value of patents, for established companies as well as for start-ups, and will analyze the benefits and pitfalls of various IP strategies.
- In Unit 3, ***Beyond Patents – the Data/AI Revolution***, we confront important, recent legal changes reigning in the scope and power of patents. We analyze the business impact of these sea changes in light of the dramatic rise of AI-powered innovation, where non-patent IP assets such as data create new, distinctive opportunities and risks.

Students who take and succeed in this course should expect to acquire insights and methods that they can utilize throughout their careers to contribute important value as stakeholders in innovative technology businesses, from emerging start-ups to industry leaders.

IV. Assignments and Presentations

The learning experience in this course includes three in-class written examinations, and two live classroom presentations, in which students will be challenged to apply the core lessons of the course. The live presentations will be prepared and delivered by small teams. **Students may not use any electronic devices during the written exams**, but hard-copy notes are permitted.

Written Exam #1: Critique and "design around" a patent claim. Students will be given (simplified) U.S. patent claims for a real-world technology, with background information about related products, publications, and/or companies. The assignment will pose questions that require students to critique the patent claims in light of the background provided and the principles we learn in Unit 1 of this class. Students will also be challenged to "design around" a patent claim.

Written Exam #2: **Select and justify a transactional IP strategy**. Students will be given information describing a competitive technology market, including the relevant patent landscape. A menu of possible IP transactions/agreements will be outlined, involving various industry stakeholders. Students will be asked to create a transactional IP strategy for a specified stakeholder by selecting from that menu; to critique alternatives; and to defend their choice.

Written Exam #3: An expanded written assignment at the end of the course will challenge students to integrate and apply the concepts, strategies, and skills they have learned throughout the course in the context of a high-stakes, strategic corporate scenario such as a prospective acquisition or investment decision, from the perspective of multiple different stakeholders.

Classroom Presentations: Create and deliver an IP analysis to management. Students will be divided into small teams. In the main project, each team will develop and present an IP protection strategy for an assigned innovation, by applying the principles learned in this course. Students who are developing their own entrepreneurial projects may be allowed to present with their team on those technologies, with the instructor's permission. Team presentations with accompanying slides should each be 15 minutes and will be followed by a brief Q&A with the class. As a smaller homework project, each team will search for "prior art" regarding an assigned patent claim and will present their findings to the class in a claim chart.

Use of Technology: You may use generative AI programs (e.g., tools like ChatGPT) to help generate and brainstorm ideas and drafts for your classroom presentations, if you wish. **However, material generated by these programs is often inaccurate, unreliable, and/or incomplete.** Use of such programs may also stifle your own independent thinking and creativity. You are entirely responsible for the accuracy and quality of the work product you submit. **If you do include material generated by an AI program, it must be cited like any other reference material**. Any plagiarism or other form of cheating will be dealt with severely under relevant Penn policies.

V. Grading

- Written exams: 60% total (20% for each exam)
- Final classroom presentation: 20%
- Short classroom presentation (claim chart): 5%
- Active class participation: 15%

VI. Readings

Required readings (and some optional readings) in preparation for each class are listed below in the course outline. The readings will generally be made available to students via Canvas. Please come to each class prepared to discuss the assigned readings.

VII. Classroom Rules and Expectations

- Each class starts and ends on time, promptly
- Class attendance and active participation are important for successful performance in this course and are both reflected in class participation grades
- Please bring and display a name card at each class
- Any requests for excused absence, or for any other exceptions to class rules, requirements, and deadlines, must be submitted to the instructor in writing by email in advance
- No use of phones, tablets, laptops, or other electronic devices during class, except when specifically directed by the instructor (e.g. for live polling in class, and for delivering classroom presentations). All phones and other electronic devices must be turned off and put away. If a student must keep a phone on by reason of a personal emergency, the student must inform the instructor before class begins. Penalties for violations of this policy may include significant loss of participation points and consequent reduction in final grade.

VIII. Office Hours

Consultation with the instructor regarding course-related issues can be scheduled upon request, subject to availability. Meetings may either be in person (my office is Towne 322) or virtual, depending on schedules, and may be with individual students or in groups.

IX. Course Schedule

Session	Date	Topic
Unit 1: Patents and Protecting Valuable Innovations		
1	Tues. Aug. 27	Introduction; IP and patent fundamentals; value propositions and patent strategy
2	Tues. Sep. 3	Critiquing and sharpening patent claims; avoiding infringement
3	Tues. Sep. 10	**Written exam #1**
4	Tues. Sep. 17	**Teams present** claim charts (5 minutes each); Guest Speaker 1
Unit 2: IP Leverage and the Corporate Playbook		
5	Tues. Sep. 24	Defensive strategies: freedom to operate
6	Tues. Oct. 1	Asymmetric patent warfare; corporate transactions and "contextual" IP assets
7	Tues. Oct. 8	IP ownership and assignment agreements; Guest Speaker 2
8	Tues. Oct. 15	**Written exam #2**
Unit 3: Beyond Patents – the Data/AI Revolution		
9	Tues. Oct. 22	A sea change in IP law: "abstractness" (*Alice*), implications for AI
10	Tues. Oct. 29	IP strategy for Big Data and Generative AI: beyond patents
Review, Student Presentations, and Final Written Assignment		
11	Tues. Nov. 5	Course review, in-class "office hour"; Guest Speaker 3
12	Tues. Nov. 12	**Student team presentations**
13	Tues. Nov. 19	**Student team presentations**
14	**Tues. Dec. 3**	**Written exam #3**

X. Course Outline

Unit 1: Patents and Innovation Value

Session 1: Introduction; IP and patent fundamentals; value propositions and patent strategy

Readings:

Strategic Patenting: Why So Few Patents Create Real Value, Jackie Hutter, on *IP Asset Maximizer Blog* (Jan. 2014):
http://ipassetmaximizerblog.com/strategic-patenting-part-1-why-so-few-patents-create-business-value/

Strategic Patenting 4: A Case Study of Success, Jackie Hutter, on *IP Asset Maximizer Blog* (Aug. 2014):
https://thehuttergroup.com/strategic-patenting-4-case-study-success/

It's as Simple as NABC, How Liz Got Her Big Job. From *Innovation: The Five Disciplines for Creating What Customers Want* (Chapter 5), Curtis Carlson and William Wilmot, published by Crown Business (August 8, 2006)

Class: Opening lecture on IP and patent fundamentals for entrepreneurs: value of exclusivity (isolation), relationship between patents and value propositions, patent claim basics, prior art, "broad vs. narrow" tradeoff. Detailed illustrations from various industries will be interactively discussed and analyzed.

Session 2: Critiquing and sharpening patent claims; avoiding infringement

Readings:

The Fidget Spinner Myth, Debunked, Shira Baratz, Fordham Intellectual Property, Media & Entertainment Law Journal (Nov. 3, 2017)
http://www.fordhamiplj.org/2017/11/03/fidget-spinner-myth-debunked

The Myth of Pinch-to-Zoom: How a Confused Media Gave Apple Something It Doesn't Own, Nilay Patel, on *The Verge* (Aug. 30, 2012)
https://www.theverge.com/2012/8/30/3279628/apple-pinch-to-zoom-patent-myth

Class: Lecture presents our four-criteria methodology for evaluating patent claims. We will interactively practice applying these criteria using several real-world examples. Next, **we will learn to do simple prior art searches and to create "claim charts" – which you will need to do for your team presentations in Session 3**. We will also look at attempting to avoid infringement by "designing around" claims.

Session 3: Student Team presentations – claim charts; Guest Speaker 1

Class: Each team will briefly present their claim chart (~ 5 minutes each). In the second half of class, an invited guest speaker from industry will share relevant experiences and will answer your questions.

Session 4: Written exam #1

In-class written examination on Unit 1. No electronic devices allowed; hard-copy notes are permitted.

Unit 2: IP Leverage and the Corporate Playbook

Session 5: Defensive strategies – freedom to operate

Readings:

Theoretical Perspectives on Patent Strategy. Deepak Somaya (Aug. 2002), **section 3 only (pp. 8-15)**
https://www.academia.edu/2486580/Theoretical_Perspective_on_Patent_Strategy?auto=download

The Apple-Samsung Case: What It Means for Patents — and Innovation, Knowledge@Wharton online article:
http://knowledge.wharton.upenn.edu/article/the-apple-samsung-case-what-it-means-for-patents-and-innovation/

How Patents Help Internet Companies – Friendster & Facebook [Case Study], online article (May 18 2012)
https://yourstory.com/2012/05/how-patents-help-internet-companies-friendster-facebookcase-study/

Don't Fence Me In: Fragmented Markets for Technology and the Patent Acquisition Strategies of Firms. Rosemarie H. Ziedonis, in *Management Science,* Vol. 50, No. 6, pp. 804–820 (June 2004)

Innovation in Multi-Invention Contexts: Mapping Solutions to Technological and Intellectual Property Complexity. Somaya, D., Teece, D., and Wakeman, S., *California Management Review*, 53(4), pp. 47-79 (2011)

Google Did Not Make a Mistake with Motorola Mobility, Conversant IP website post (February 6, 2014): http://www.conversantip.com/blog/google-did-not-make-a-mistake-with-motorola-mobility/

Facebook Buys AOL Patents from Microsoft for $550 Million, Wall St. Journal (April 23, 2012)

(**optional**) *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting Innovation*. Carl Shapiro, Chapter 4 from *Innovation Policy and the Economy – Volume 1*, MIT Press (January 2001), available online at: http://www.nber.org/chapters/c10778

Class: Lecture on the patent "hold-up" problem, patent thickets/minefields, and a close look at the corporate playbook of defensive strategies for securing freedom-to-operate.

Session 6: Asymmetric patent warfare

Readings:

From Arms Race to Marketplace: The New Complex Patent Ecosystem and Its Implications for the Patent System. Colleen V. Chien in *Hastings Law Journal*, Vol. 62, pp. 297-356 (December 2010)

Patent Strategies of Technology Startups: An Empirical Study. Paper by Celia Lerman*, May 25, 2015.* *https://papers.ssrn.com/abstract=2610433*

LOT Network
https://lotnet.com/, https://lotnet.com/how-lot-works/

(**optional**) *Patents, Thickets and the Financing of Early-Stage Firms: Evidence from the Software Industry*. Iain M. Cockburn and Megan MacGarvie, NBER Working Paper No. 13644 (November 2007)

(**optional**) *Comments of Google, Blackberry, Earthlink and Red Hat to the Federal Trade Commission and U.S. Department of Justice on Patent Assertion Entities* (April 5, 2013)
https://docs.google.com/file/d/0BwxyRPFduTN2VTE4TXlNcW9MR2s/edit

Class: Lecture on how patent leverage works in the context of *asymmetric exposure*. Implications for start-ups, non-practicing entities, and mature companies.

Session 7: IP ownership and assignment agreements; Guest Speaker 2

Class: Lecture on IP ownership, assignment, and related agreements; followed by an invited guest speaker from industry who will share relevant experience share relevant experiences and answer your questions.

Session 8: Written exam #2

In-class written examination on Unit 2. No electronic devices allowed; hard-copy notes are permitted.

Unit 3: *Beyond Patents – the Data/AI Revolution*

Session 9: A sea change in IP law: "abstractness" (Alice), implications for AI

Readings:

Patently Absurd, James Gleick, New York Times Magazine (March 12, 2000)
http://www.nytimes.com/2000/03/12/magazine/patently-absurd.html

Alice Corp. v. CLS Bank International, 134 S. Ct. 2347 (2014)
https://www.supremecourt.gov/opinions/13pdf/13-298_7lh8.pdf

USPTO Abstract Idea Examples (issued January 27, 2015) (examples nos. 2 and 8)
https://www.uspto.gov/sites/default/files/documents/abstract_idea_examples.pdf

USPTO Subject Matter Eligibility Examples: Abstract Ideas (January 2019 update)
https://www.uspto.gov/sites/default/files/documents/101_examples_37to42_20190107.pdf

(optional) USPTO 2019 Revised Patent Subject Matter Eligibility Guidance
https://www.govinfo.gov/content/pkg/FR-2019-01-07/pdf/2018-28282.pdf

Mapping the patent landscape of medical machine learning, Aboy, M., Price, W.N. & Raker, S., Nature Biotechnology 41, 461–468 (2023)

Class: Lecture on the recent dramatic shift in US law on what is eligible for patenting. We examine positive and negative examples, and consider practical guidance for software innovation, especially AI.

Session 10: IP Strategy for Big Data and AI: Beyond Patents

Readings:

The Half-Truth of First-Mover Advantage, F. Suarez and G. Lanzolla, Harvard Business Review (April 2005)

Why being first doesn't matter, blog post on intercom.com website:
https://blog.intercom.com/why-being-first-doesnt-matter/

Network Effects Aren't Enough, Andrei Hagiu and Simon Rothman, Harvard Business Review (April 2016)

How Strong Are Network Effects Online, REALLY? Business Insider (May 19, 2011) at:
http://www.businessinsider.com/network-effects-2011-5

Network Effects. Andreesen Horowitz slide presentation at:
http://www.slideshare.net/a16z/network-effects-59206938

See especially this slide and surrounding slides:
http://www.slideshare.net/a16z/network-effects-59206938/82-MAX_LEVCHINThe_defensibility_of_these

https://www.youtube.com/watch?v=5cbCYwgQkTE (Holly Henderson Ted Talk)

https://www.npr.org/transcripts/1119220726 (NPR interview w/ Holley Henderson)

https://www.newyorker.com/culture/cultural-comment/what-to-do-about-fake-drake-songs

https://www.newyorker.com/science/annals-of-artificial-intelligence/there-is-no-ai (re: "data dignity")

(optional) https://www.youtube.com/watch?v=pGntmcy_HX8 (WSJ tech background on Spotify AI DJ)

Class: Lecture on alternatives to patent protection, especially for data-driven innovation. We will examine so-called "first-mover advantage" and several related concepts (stickiness, network effects), and consider the extent to which they offer sustainable competitive protection. We will also discuss some of the fascinating IP challenges posed by generative AI, analyzing examples drawn from entertainment and other industries.

Session 11: Course review, in-class "office hour"; Guest Speaker 3

Class: In the first half we will review key takeaways from the course and answer your questions, as preparation for written exam #3. In the second half of this session, an invited guest speaker from industry will share relevant experience share relevant experiences and answer your questions.

Sessions 12 & 13: Student Team Presentations

These sessions will be devoted to **live presentations by student teams**. Each team presents and defends a proposed strategy for its pre-assigned IP strategy challenge, followed by interactive class discussion.

Session 14: Written exam #3

In-class written examination covering all 3 units. No electronic devices allowed; hard-copy notes are permitted.