

Syllabus, 06/28/2017 version

RESEARCH TO REVENUE
Fall 2017, Wednesdays 2.45-6.00pm, Uris 333

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Course Description

The target audience for this course is MBA and Engineering students interested in developing business models that drive value from intellectual property. What makes this course different from many other innovation and entrepreneurship courses is the focus on turning scientific research into intellectual property and then into business value.

As a world-class research institution, Columbia University is a prime producer of academic research. Every year Columbia researchers submit inventions on over 350 potential breakthroughs, which Columbia's office of Columbia Technology Ventures converts into over 100 licenses with industry, including 20+ new startup companies, which collectively have generated hundreds of millions of dollars in licensing revenue for Columbia and its researchers over the past decade. However, even with this track record, for every invention that reaches the market there are many more that never find a commercial partner to complete the journey.

Such resources, which are available only at a world-class research institution like Columbia University, may be turned into a source of competitive advantage by students interested in entrepreneurship. Indeed, one of the major ways in which companies (in particular technology-based startups) create barriers to entry is through their intellectual property, including patents and trade secrets. Collaboration with academia is a great way to create such barriers to entry.

This course trains students to identify and pursue innovation opportunities that rely on intellectual property coming out of scientific research. It provides students with some basic knowledge of research frontiers in relevant fields of knowledge, as well as tools and frameworks for developing business models based on scientific research. In addition, the course connects students with different backgrounds and skills, and trains them to collaborate effectively with each other.

Enrollment in this course is limited, and split evenly between the Engineering School and the Business School.

Project

Lectures are complemented with a hands-on project. Projects are proposed by teams of Columbia researchers (PhD students, Post Docs, and at least one faculty sponsor per project)

who have developed academic research with commercial potential, and have submitted that invention to Columbia Technology Ventures for an initial patentability and commercial analysis. Priority will be given to projects for which students could develop a tangible deliverable (prototype of Minimum Viable Product) within the time frame of the course. Teams of MBA and Engineering students work on these projects jointly with the researchers throughout the course.

Researchers will benefit from the business development and prototyping work of the student teams. Students will benefit from the opportunity to work on tangible early-stage business ideas, and experience the benefits of studying at a world-class research university. Interested students may leverage the many resources available at Columbia to pursue their projects further beyond this course (e.g., i.e@Columbia, Columbia Venture Competition, and the various entrepreneurship bootcamps offered throughout the campus).

Project deliverables:

- A Business Model (based on the Research to Revenue “Business Model Roadmap”)
- A demo
- Some primary market research
- A pitch (to the audience of your choice, e.g., investors, grant agencies, partners, customers)
- A written report which includes technical advantages over competitive technologies. The report should have sufficient technical depth such that specialists in the field can grasp the advantages over competitive technologies

Evaluation Overview

Class participation	20%
BMC case write up	10%
Project	70%

Tentative Schedule

Session	Class Topics	Project Work	Due that day
1 09/06	Course introduction Modern Meadow discussion		Read: "Why the Lean StartUp Changes Everything"
2 09/13	Modern Meadow discussion debrief	Project pitches / team formation	Hand in Modern Meadow Business Model Roadmap Prepare project pitches (student inventors) Send your top 3 project preferences by Friday
3 09/20	Disruptive Technologies	Customers, Competitors, Experts, Research to Revenue Roadmap	Read: "What is Disruptive Innovation?" "Will Disruptive Innovations Cure Health Care?"
4 09/27	Intellectual Property (Orin Herskowitz, Executive Director of Columbia Technology Ventures)	Regulators, Lawyers, Patent Office / grantors of IP, Academic Institutions / Labs	Watch: http://techventures.columbia.edu/news-events/videos/patenting-licensing-early-stage-university-technology http://techventures.columbia.edu/news-events/videos/patents-101
5 10/04	Customer Discovery Designing complex products and services (Voice of the Customer / House of Quality)	Customers	Read: "Note on the Voice of the Customer" "How Puritan Bennett used the House of Quality"
6 10/11	Product development	Research to Revenue Roadmap	Read: "Share and share alike"
10/18	Mid-term pitch preparation and discussion of technical metrics (optional for students registered via business school, mandatory for those registered via SEAS)		Each project team presents one slide on a draft of technical metrics
7 10/25	Mid-term pitches	MBA students present technical metrics, SEAS students present business side	Prepare mid-term pitches
8 11/01	Mid-term follow up	Each team meets with instructors	
9 11/08	Financing	Funders, Employees, Distributors	
10 11/15	Research frontiers		
11 11/29	Research frontiers		
12 12/06	Next steps and additional resources	Final project presentations	

