IEOR E4550.001
ENTREPRENEURIAL BUSINESS CREATION FOR ENGINEERS

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Syllabus – Spring, 2015

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ENTREPRENEURIAL BUSINESS CREATION FOR ENGINEERS

Wednesdays, 4:10 – 6:40 p.m.

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Prof. Gulley is on campus one day per week. He is available on other days via telephone. Students wishing individual attention should email him in advance to set up an appointment. Initial discussions will be by telephone. Dr. Gulley welcomes "Linkedin" invitations – after the student has graduated.

Course Readings

1. Textbook: Byers, Dorf and Nelson, 2011, *Technology Ventures – From Idea to Enterprise*, McGraw-Hill
2. Supplemental Readings: To be assigned.

Introduction

The educational goals for this class are threefold: First, to understand the commercialization of new scientific discoveries and technologies; second, to understand what is required to build a successful business enterprise; third, to gain some appreciation of some of the basics of organizations and organizational behavior, and the legal framework in which business operates. In short, the class seeks to identify critical success factors in entrepreneurship and give the student the opportunity to exercise related skills. The class can be taken as a stand-alone class, but it also dovetails with other courses in the SEAS Entrepreneurship minor.

We will explore different business models, such as transactional, subscription, advertising, and fee-based revenue and profit models. We will look at entrepreneurship on Wall Street, Main Street, Silicon Valley, and the Life Sciences. We will cover basic

legal and financing fundamentals. We will learn how to evaluate a variety of businesses. We will apply what we learn via case studies and business plans.

Moving from generalities to specifics, the course will cover specific themes:

1. Entrepreneurship, jobs, and the economy. The role of innovation in a market economy. Career opportunities in emerging growth companies.
2. The external environment of a business, such as: Markets, customers, suppliers, investors, regulatory and legal framework, and financial foundations. Market entry is a particular focus.
3. The internal environment of a business, such as: Organizational forms and processes, business ethics and law, and organizational life as an employee and as a manager, supervisor, and ultimately, business leader.
4. The technology-based business, from research commercialization and intellectual asset management to business start-up and launch.
5. Financing start-up companies: basics of seed capital, introduction to angel investing and venture capital.
6. Case studies of how technology entrepreneurs succeed and fail.
7. Analysis of key issues in entrepreneurship.
8. Cultivation of skills needed to succeed in business.

The aim of the course is to cover these topics individually and to integrate them so the interdependencies are clear and critical success factors can be appreciated. The special circumstances of small international businesses will be specifically addressed.

The background of students enrolled in this course is diverse. As a result, students may find that some of the subjects are already familiar to them. When this occurs, please point it out so that I can accommodate everyone to the extent practical.

Course Requirements

Students are expected to be familiar with basic concepts of economics and finance. ECON W1105 and W2261 or their equivalents are prerequisites.

Course requirements and student evaluations will be based on a combination of individual and team assignments. Students are expected to attend all classes, keep up with class readings, participate actively and thoughtfully in class, and complete all assignments on time.

Grades in the class will be assigned in the classic ten-point grading system, i.e., 90-100=A, 80-89=B, et cetera. Students Will be evaluated on the basis of four graded assignment and will have the opportunity to earn extra credit via class participation and presentations:

- Mid-term and Final examinations. (25 points each.) The exams are closed-book, in-class exams, primarily short-response and multiple-choice in nature; students will be evaluated on their comprehension of readings, lectures, and guest speaker presentations.

- Market Opportunity Analysis. (25 points.) Student teams will research specific STEM-related market opportunities and present to the class. Alternatively, student teams may research in-depth an issue or topic germane to entrepreneurship. Teams will be evaluated on their written submission and oral presentation, and with recognition of the level of resources expended (i.e., the number of students involved).

- Final Project. (25 points.) Students will work in small teams on a final project of their choosing. The final project will be evaluated on the basis of written submission and oral presentation. Final projects will often take the form of a new business plan, depending upon the student's specific interests.

- Individual Initiative and Class Participation. (10 points.) Additional bonus points will be awarded at the discretion of the instructor. Student suggestions and initiative are most welcome.

Student Conduct

Courteous conduct, focused attention, and respectful debate are standard procedure in the business world and in the class room. Similarly, in team assignments everyone is expected to "add value" in some way or other. Owing to the nature of the subject, consistent attendance is expected. Multi-tasking is strongly discouraged: Students are expected to switch off cell phones, and other devices.

It will come as no surprise to the student that Columbia's policies about cheating, plagiarism, externally sourced papers and reports, et cetera will be strictly observed. Indeed most students welcome this policy. **Copy-and-pasting of text "because I can't improve on the original text" is tolerated when the passage is brief and proper citation is given. Anything other than that will be construed as plagiarism and will result in penalties ranging from an "F" on the assignment to disciplinary hearings.** All students in the team are held responsible for plagiarism on an assignment.

Course materials are the intellectual property of the instructor and are shared with the student for educational purposes. Uploading any of these materials to the World Wide Web or any other use is copyright infringement and subject to academic and legal proceedings.

Audio and video recording of lectures is prohibited. The instructor and guest lecturers will from time to time wish to share real-life experiences, and attempts to record this information verbatim have a chilling effect on our ability to impart useful lessons via case examples.

Course Scheduling and Format

The course will meet one timely weekly for 150 minutes, for the duration of the term. Most class sessions will include a lecture, active discussion of readings and emerging topics, and presentations by outside experts and/or by students.

The following schedule is preliminary and subject to change:

1. (1/21) Professional Opportunities for the SEAS Student and Why Study Entrepreneurship?
2. (1/28) An Overview of Starting a Successful Business
3. (2/4) Analyzing Opportunities and Planning to Address Them
4. (2/11) Your Product, Your Competitors, and Your Customer
5. (2/18) Market Entry, from Launch to Expansion
6. (2/25) Forming Your Team, Managing Your Start-Up
7. (3/4) **IN-CLASS PRESENTATIONS BY TEAMS**
8. (3/11) **MIDTERM EXAM**
9. (3/18) *NO CLASS - SPRING RECESS*
10. (3/27) The Business Plan and its Uses
11. (4/1) Legal Requirements and Intellectual Property
12. (4/8) Business Models and Financing; Sources of Capital
13. (4/15) Research Commercialization and STEM-based Start-ups
14. (4/22) The Internet, IT, and Your Start-up
15. (4/29) **IN-CLASS PRESENTATIONS BY TEAMS**
16. (5/7) *NO CLASS - STUDY PERIOD*
17. (5/14) **FINAL EXAM**