

## ECON/ENTP 464

### TECHNOLOGY ENTREPRENEURSHIP

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Class Hours: Tuesdays 6:00pm – 8:00 pm  
Office Hours: By appointment

#### Required Text

Shane, S. 2005. Finding Fertile Ground: Identifying Extraordinary Opportunities for New Ventures, Upper Saddle River, NJ: Wharton School Publishing.

Course pack available from <http://Xanedu.com>

#### Course Description

Historically, entrepreneurship has been taught with a heavy focus on the behavior of individual entrepreneurs. Students are taught that a daring, risk-taking, motivated, hardworking entrepreneur can overcome all obstacles to build a successful new company, and become rich in the process. As a result, many MBA students have become enamored of the idea of starting a company. Often they start companies based on products or processes that cannot be designed or developed, or at least not in a cost-effective manner. Moreover, they fail to identify valuable opportunities, or opportunities for which true customer needs exist and for which sustainable competitive advantages can be developed by new firms. Nowhere is this problem more salient than in the area of high technology. Adopting the right technology, at the right time, under the right organizational arrangement, accounts for much of the difference between the success and failure of entrepreneurs.

This course is designed to help students to identify, evaluate, and obtain control over technology opportunities that they can successfully exploit by starting new companies. The course focuses on four themes: (1) the source, discovery, and evaluation of technological opportunities (2) the process of organizing innovation to produce new technology that satisfies the needs of customers, (3) the different mechanisms available to appropriate the returns from the exploitation of technological opportunities, and (4) the approaches that are valuable and sustainable for independent entrepreneurs.

#### Learning Objectives:

By taking this course, you will learn:

1. The process by which new companies develop new technology products and services.
2. Ways to identify business opportunities in high technology for which new firms are most likely to be successful.
3. How investors analyze new technology companies.
4. The right strategy for exploiting new technology opportunities.

## **Class Format**

The course is comprised of lectures (by the instructor and guests) and case discussions. The combination of these activities allows us to bring together theoretical frameworks garnered from academic research (instructor lectures) with hands-on process knowledge developed by engaging in high technology entrepreneurship (guest lectures) and analysis of entrepreneurial situations (case discussions).

Each session not led by a guest lecturer will involve both a lecture and a case discussion. The purpose of joining the two components is to allow students to use theoretical frameworks from readings and lectures as tools to analyze the cases. Because the value of the case discussion lies in your efforts to apply theoretical frameworks to the situation being analyzed, it is very important that you read both the case and assigned readings and that you participate in the discussion of the cases.

To encourage participation, class discussion counts for one fifth of the grade. Students start off with zero participation points (i.e., an “F”) and accumulate points through their contributions to classroom discussions. Attendance does not equate to participation.

Students will be randomly called upon to identify the key issues in assigned cases. Class presentation points are based on the quality (not simply quantity) of the student’s discussion of those issues.

## **Assignments**

In addition to class participation, there will be four assignments in this class. The first two assignments are evaluations of the cases. You will be asked to select two of the cases during the semester on which you will write an evaluation. Your evaluations will make recommendations that answer the discussion questions. You are expected to base your evaluation on the tools and frameworks that are discussed in the readings assigned along with the case. You will need to summarize the relevant facts and assumptions on which your recommendations are based. Your case evaluations are limited to two pages single-spaced. You must turn in your case write-up to the instructor prior to the case discussion to receive credit for the write-up

The third assignment is an in-class midterm exam, which will ask you to apply the knowledge of the concepts developed in the first half of the class.

The fourth assignment is a take home final exam. This assignment will require you to apply the knowledge of the concepts developed in the class in the evaluation of a new technology company. You will be expected to evaluate a new high technology venture seeking early stage financing. You will be expected to back up your evaluation with an analysis of the venture’s business plan summary in a four page-single spaced memo.

## **Grading Criteria**

Case Evaluation 1	15%
Case Evaluation 2	15%
Midterm	25%
Investment Evaluation	25%
Class participation	20%

## **Academic Integrity:**

All students in this course are expected to adhere to university standards of academic integrity. Cheating, plagiarism, and other forms of academic dishonesty will not be tolerated in this course. This includes, but is not limited to, consulting with another person during an exam, turning in written work that was prepared by someone other than you, and making minor modifications to the work of someone else and turning it in

as your own. Ignorance will not be permitted as an excuse. If you are not sure whether something you plan to submit would be considered either cheating or plagiarism, it is your responsibility to ask for clarification. Either ask me about it or consult credible sources of information on the subject. Two useful internet sites are:

<http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml>

<http://www.unc.edu/depts/wcweb/handouts/apa.html>.

Please remember that you have agreed to Standards Regarding Academic Integrity (a copy of which can be found at:

<http://weatherhead.case.edu/pdpao/policy/policyhome.html>), which outlines your responsibility in greater detail.

## ASSIGNMENTS

- 1/16 INTRODUCTION, DISCUSSION OF ASSIGNMENTS  
LECTURE: IDENTIFYING OPPORTUNITIES  
*Read:* Introduction and Chapter 2, Finding Fertile Ground  
CASE: THREE DIMENSIONAL PRINTING
- 1/23 LECTURE: UNDERSTANDING CUSTOMER NEEDS  
*Read:* Chapter 4, Finding Fertile Ground  
Examine: Sawtooth Software's SMRT v4.7 Demonstration Software  
Download at: <http://www.sawtoothsoftware.com/downloads.shtml#ssiweb>  
EXERCISES: Mountain bike tires  
Market research errors
- 1/30 LECTURE: PRODUCT DEVELOPMENT  
*Read:* Product Development: A Customer Driven Approach  
CASE: SWEET WATER  
*Discussion Questions:*  
What are the most important user needs in the water purifier market?  
How should Platter gather information about user need?  
How can you structure this user needs data to assist Platter in creating his product concept?  
How does Sweetwater's product compare to competitors' products in meeting customer needs?
- 2/6 LECTURE: UNDERSTANDING DEMAND  
*Read:* Chapter 5, Finding Fertile Ground  
CASE: FORECASTING THE ADOPTION OF E-BOOKS  
*Discussion Questions:*  
Assume that you are making a prediction from the time e-books first became available (year 2000). Although early unit sales data for e-books are available, construct your forecast irrespective of these sales?  
What do you expect the long-run total adoption of e-books to be?  
Do you expect the market for e-books to be guided more by imitators or innovators? Why?

Once you have modeled the first-time adoption of e-books, create a 5-year annual forecast of the overall demand for e-books.

What role will hardware devices play in the adoption of e-books?

2/13 LECTURE: TECHNOLOGY EVOLUTION, INCREASING RETURNS, NETWORK EFFECTS, AND STANDARDS

*Read:* Chapter 3, Finding Fertile Ground

CASE: ELECTRIC VEHICLES: PIPE DREAM OR PRODUCT OF THE FUTURE?

*Discussion Questions:*

Where is the technology headed? Why?

If you were managing a conventional car company, what technology would you invest in to replace the internal combustion engine? Why?

Would you invest in an electric car company start up? Why or why not?

If you were to invest in an electric car company, where would you invest? How would you invest?

2/20 GUEST LECTURE: INFRASTRUCTURE FOR ENTREPRENEURSHIP

Ray Leach Jumpstart, Inc.

*Read:* The Metropolitan New Economy Index

Download at: <http://www.neweconomyindex.org/metro/index.html>

2/27 MIDTERM EXAM

3/6 GUEST LECTURE: HIGH TECH VENTURE TEAMS

John Westropp and Chris Conti, Christian and Timbers

*Read:* C. Gordon Bell and John E. McNamara. 1991. The People. High-Tech Ventures: The Guide for Entrepreneurial Success, Reading, MA: Addison-Wesley Publishing Company, 1991 (To be handed out in paper form at the beginning of the semester)

3/20 LECTURE: PROTECTING INTELLECTUAL PROPERTY

*Read:* Chapter 7, Finding Fertile Ground

CASE: CVD VS. A.S. MARKHAM CORPORATION

*Discussion Questions:*

What are the critical legal issues in this case?

As a juror, what decision would you reach on each of these issues? On what facts do your decisions hinge?

With the benefit of hindsight, what could A.S. Markham have done to prevent this case from occurring?

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#### GUEST LECTURE: UNIVERSITY SPINOFFS

Mark Cottichia. Case Western Reserve University Technology Transfer Office

*Read:* Shane, S. 2002. "Executive forum: University technology transfer to entrepreneurial companies." Journal of Business Venturing, 17: 537-552.

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#### LECTURE: APPROPRIABILITY, CAPABILITIES AND INNOVATION STRATEGY

Read: Chapters 1, 6, 8, and 9 Finding Fertile Ground

#### CASE: CONTINUOUS CASTING INVESTMENTS AT USX CORPORATION

*Discussion Questions:*

Do you think Kappmeyer should sign the proposal? Why or why not?

What position should USX take with respect to CSP technology?

How did Nucor and the other minimills exploit USX's strategy to their advantage?

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#### LECTURE: CULTURE, PEOPLE, STRUCTURE, AND TOOLS

*Read:* Chapter 12 in S. Shane, Forthcoming. Technology Strategy for Entrepreneurs and Managers, Englewood Cliffs, NJ: Prentice Hall.

#### CASE: CORPORATE NEW VENTURES AT PROCTOR AND GAMBLE

*Discussion Questions:*

How does Proctor and Gamble encourage creativity? What do they do that is effective and ineffective?

Is it possible to encourage entrepreneurial activity within a large, established company? Why or why not? If yes, how do you do it? If not, what should you do instead?

Is CNV the right model for Proctor and Gamble? Why or why not? What are the costs and benefits of the model?

Evaluate the CNV processes. What would you keep? What would you change? Can they be scaled up to the level of the entire organization?

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#### GUEST LECTURE: FINANCING NEW VENTURES

Jamie Ireland, Early Stage Partners

*Read:* New Venture Financing

How Venture Capitalists Evaluate Venture Opportunities

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ORGANIZING FOR INNOVATION

LECTURE: CORPORATE VENTURING AND OTHER MODELS OF ORGANIZING

*Read:* Chapter 10, Finding Fertile Ground

CASE: INTEL CAPITAL: THE BERKELEY NETWORKS INVESTMENT

*Discussion Questions:*

How does Intel engage in corporate venturing? What alternative models could it have adopted? What are the advantages and disadvantages of the approach Intel took?

Why did Intel decide to invest in Berkeley networks? Why did Berkeley networks invite Intel to invest? If you were a founder of a start-up, would you want Intel as an investor in your company? Why or why not?

How does Intel Capital's investment process differ from that of a private venture capitalist?

Is external investment in R&D a complement or a substitute to internal investment in R&D?

What, if anything, is Intel learning from its investment in Berkeley Networks?