INTRODUCTION AND COURSE OBJECTIVES

The course Applied Technology Entrepreneurship will walk you through the process of starting a new technology-based venture - from the original idea to commercialization. Through lectures, guest lectures, hands-on exercises and case analyses, you will acquire a set of cross-functional concepts in finance, law, marketing and strategy. These concepts will be rigorously applied to a class project focused on the development of a technology-based idea. In collaboration with the Office of Technology Commercialization, the students will have an option to work on the commercialization of technologies developed within the University of Minnesota.

The class projects developed in teams will be presented in front of judges who are investors or industry professionals. Students will be encouraged to submit their business plans to Minnesota Cup.

In particular, you will develop your skills at:
• Understanding the process of starting a new technology-based startup,
• Identifying and analyzing entrepreneurial opportunities,
• Formulating strategies and plans to commercialize the technological opportunities,
• Understanding all aspects of a technology-based startup including financing, organization, marketing and legal aspects.

Who is the course for?
The course is designed for upper-level students from the College of Science and Engineering, College of Biological Sciences, College of Food, Agricultural and Natural Sciences, College of Design and the Carlson School. Graduate students are also very welcome. We are looking for
students who have an idea related to a technology based product/service OR are interested in working in a team to develop one.

Course content:
The course has two main components. The first component focuses on the development of the cross-functional concepts – through the study of the theory and practice of technology entrepreneurship. The extant theory within the disciplines of strategy, accounting, economics, finance, marketing, law and organization theory has important implications for technology entrepreneurship. Thus, this course emphasizes the development of core concepts through lectures and discussion and application of these concepts through the case analyses and hands-on exercises. No prior knowledge of case method is required. The second component - which constitutes the core of the class - is a project that focuses on the identification, evaluation and implementation of a technology-based entrepreneurial opportunity. The project will provide a hands-on experience to apply the acquired concepts in a real world setting.

Entrepreneurship deals with the world of uncertainty. Thus, within the classroom, reasonable people (with different experiences) will view entrepreneurial opportunities differently. Entrepreneurship involves making sense together, and is a creative and subjective process. Conjectures and knowledge based on personal experiences are highly valued within the conversation of this class. Creativity will be rewarded in your participation grade, individual papers, and group projects. The course also rewards the diligent worker who has the ability to listen and think critically. This course requires that you process a great deal of material and is writing intensive. Both the midterm and final exam will test your ability to understand the material in the textbooks, readings, and class notes. Please note that the evaluation of your project and the exams measure different skills.

TECHNIQUES FOR LEARNING TECHNOLOGY ENTREPRENEURSHIP

To accomplish our objectives, we will use a variety of learning techniques: lectures, guest lectures, readings, written reports, presentations, class discussion and, most importantly, the new venture project.

Technology Venture Project
The principal project for the semester is the development of a technology venture. The project consists of three stages – Idea generation and selection, Opportunity analysis and Business Plan. At each stage, you will present your progress to the class (or outside guests) and receive feedback. You will be able to work on your ideas or on the commercialization of a technology provided by the U of M Office of Technology Commercialization. It is possible that the project might result in an actual new business — there are instances of substantial firms that were conceived in new venture development courses. However, even if the plan does not give birth to a new business, the learning that is gained will equip you to deal effectively not only in starting a new business but also for dealing with startups as an investor, banker, lawyer, customer, vendor, or employee.

The project will be evaluated based on the quality of the idea and the implementation strategy. The output of the project are not only the presentations but also a written report of quality that
will pass muster with the most critical venture capitalist or bank loan officer. The final report should not exceed 25 pages. You will be encouraged to submit the plan to the Minnesota Cup – a business plan competition.

Case Analysis
Entrepreneurial thinking and analysis are best learned through practice. The cases we will study concern real-world situations related to technology entrepreneurship. These cases are designed to provide you with information on real-life problems, and case analysis is useful as a simulation of actual events. These integrative cases provide an opportunity to both apply the concepts that we discuss in class as well as to further develop our ability to think about entrepreneurship. How much you learn from these cases depend on your preparation and active participation. Each of us will be responsible to be fully prepared for each class. Every class, there will be a short assignment to be handed in. Everyone is expected to participate effectively in each class to comment, question, and analyze.

Objectives of Case Analysis:
- Increase your understanding of what entrepreneurs should and should not do in guiding business to success;
- Build your skills for conducting analysis and gaining in-depth experience in a variety of industries, competitive situations, and company circumstances;
- Obtain valuable practice in diagnosing entrepreneurial issues, evaluating alternatives and formulating workable plans of action; and
- Enhance your sense of judgment.

Group Work
Effective group work will be essential for the successful completion of the class project. Developing effective group skills is a critical part of the learning process. It is a good idea to have students with different areas of expertise in the group to facilitate the exchange of a variety of viewpoints and to help guard against “groupthink.”

Exams
There will be two in-class (closed-book) exams during the semester. These in-class exams will test both your mastery of the concepts and your ability to apply them. I will go through sample exams before each actual exam.

EXPECTATONS AND POLICIES

Preparation: I will assume that you have read everything assigned. It is especially valuable and appreciated when you come to class with questions about the readings. Poor preparation is a disservice to your classmates and will negatively impact your participation grade.

Class Participation: Most of the learning in our class will occur through discussion. Thus, we want everyone’s active participation. Discussion will be a key in providing feedback on the class project. Meaningful participation requires having carefully read and thought about the day’s material, but that is not sufficient. You also need to speak and while key insights are appreciated,
you can also contribute by asking questions, politely disagreeing with comments, or following up on another student’s comments with further insights or evidence.

**General policy for hand-in assignments:** One purpose of the assignments is to enhance class discussion. Thus, (hard-copy) assignments must be turned in before class begins on the day that they are due. You should bring a copy to class for your own reference during discussion. Assignments placed in my mailbox or under my door will not be accepted. If you are ill I will accept the assignment by e-mail Word attachment if it is received before the beginning of class on the day it is due. There will be no credit provided for late assignments.

**Homework assignments (“Opt-in Memo”):** Several days before each class, I will post a set of questions about the readings and/or the case scheduled to be covered in the class. Unless otherwise noted, you are expected to bring to each class a one-page memo summarizing your response to these questions. These can be brief bullet points. Handwritten memos are also acceptable. The purpose of the memo is to help you prepare for the class. The content of the memo will not be graded for the accuracy of answers but if I see that you created the memo without reading the assigned material it will not be accepted (grading for the memo is pass/fail). The hand-in memos will be also used to keep track of attendance. If you don’t hand in the memo or if you hand in the memo without preparation, I will record that you missed the class. Further, I will randomly draw from the pile of memos to ask questions during the class.

**Attendance and Punctuality:** You cannot contribute to our learning if you are not in class. At the same time, it is understood that you may have other responsibilities and priorities. To balance these considerations, you are allocated two excused allowances. You can use these as you wish (e.g., job interviews, family needs, health days) with no questions asked. On these occasions, you are still responsible for turning in your assignment before the class session that you will miss. Please note that I will not make arrangements for homework after the fact. For each absence beyond these two, 2% will be deducted from your individual participation grade. You may not use an excused absence on the day of an exam. In the event of illness, please bring a note from either the Health Center to the next class session. Please be on time. If lateness becomes an issue, I reserve the right to treat a class for which you are late as a missed class.

**Course Organization:** Class assignments are shown in the schedule attached, and while subject to change, this schedule should guide your work plans.

**Technology:** All mobile phones and other electronic devices must be turned off during class. Please do not leave and re-enter the class. Use of laptops in the class is allowed only to perform class-related activities in specific cases. Otherwise, the class will have a closed-laptop policy.

**Moodle2:** We will use Moodle2 for the distribution of materials including slides and handouts. Also, I will post articles and homework questions for the next class period on Moodle2. You are responsible for checking Moodle2 sometime after 4 p.m. the day before class to see if I have posted anything. If I have, please print it out and bring it to class.
Suggestions: If you have special inquiries or constructive suggestions concerning the progress of the class, please feel free to talk to me. You can make an appointment by telephone, e-mail, or simply leave a message in my mailbox in Carlson School #3-365.

COURSE TEXTS AND CASES

Required Textbook:

Required additional cases (not in the textbook - HBS cases):
1) The Langer Lab: Commercializing Science
2) Marketing the "$100 Laptop"
3) Neverfail Computing

The cases are available through HBS publishing:
Link [http://cb.hbsp.harvard.edu/cb/access/14522782](http://cb.hbsp.harvard.edu/cb/access/14522782)

Required articles:
UM OTC Guidebook (Moodle2)
How to read financial statements (Moodle2)

Supplementary Materials

Textbook supplementary website: [http://techventures.standord.edu](http://techventures.standord.edu)
Additional websites and articles will be posted on Moodle2 during the semester.

COURSE REQUIREMENTS AND GRADING

The final grade for the course will be determined based on performance in the following:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Total Points (of overall grade)</th>
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<tbody>
<tr>
<td>Participation (8% attendance, 6% in-class participation and 6% peer feedback)</td>
<td>20</td>
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<tr>
<td>Mid-term exam</td>
<td>15</td>
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<tr>
<td>Opportunity analysis presentation</td>
<td>10</td>
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<tr>
<td>Business plan (presentation and document)</td>
<td>35</td>
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<tr>
<td>Final exam</td>
<td>20</td>
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Letter grades:

Following the Carlson School guidelines, the *median* grade for the class will be set to B+ (3.3). Your progress during the semester will be reported with respect to the class median.

Some additional comments:

- An A is not an entitlement: you need to do a great job to get an A.
- You will receive a C or C- if you complete all assignments, but with chronic lateness and/or minimum quality.
- You will receive a D or F if you do not complete the course requirements or engage in academic dishonesty.

**DETAILED EXPLANATION OF MAIN ASSIGNMENTS**

**Idea Journal/Top Idea Presentation**

Successful entrepreneurs are constantly thinking of ideas for new products, services or businesses. Accordingly, starting in Session 2, you should keep a journal of potential ideas for new ventures. Ideas cannot be existing products/services and must be feasible through entrepreneurship (i.e. go beyond the identification of a technological problem). By Session 5, you should have at least 10 ideas in your journal. The homework assignment for Session 5 will be to hand in the list of ideas. Homework assignment for Session 7 is to prepare a very short (2-5 min.) presentation of your top idea (submit the slides or short summary). You can elaborate on the following structure:

“For (target customer) who (statement of the need or opportunity), the (product/service name) is a (product/service category) that (statement of benefit). Unlike (primary competitive alternative), our product (statement of primary differentiation).”

I will post the best idea of each student on Moodle2. Review this list of ideas and then email me your top 2-3 choices (you may include your own idea) before October 1. Also indicate whether there are any ideas that you would not like to pursue. You have the option of forming a team around your own idea or joining a team formed around another classmate’s idea. Using your preferences, I will assign teams (announced in Session 8) for the group project.

**Opportunity analysis presentation (Session 17)**

The Opportunity Analysis is a step towards the full-fledged business plan. You will work in teams to investigate an entrepreneurial opportunity, keeping in mind the key distinctions between an “idea” and an “opportunity.” Your presentation should thoroughly illustrate and document a pressing market need that could be solved by your business.

Some thoughts to keep in mind as you begin:

a) It’s imperative to clearly explain the team’s opinion whether and why this is a business opportunity worthy of pursuit at this time.

b) Enthusiasm and passion are encouraged, but an over-the-top “sales” pitch is not useful for this learning exercise. It is perfectly okay to ask the tough questions and explain the strengths and
limitations to what the team's analysis has uncovered so far. A 15-minute team presentation is scheduled for either Session 17 or 18. The presentation should focus only on recognizing and defining a market opportunity and the necessary requirements for seizing that opportunity.

**Business Plan Presentation and Paper (Sessions 28 and 29)**

The key project for the semester is the development of a business plan for a new business. We will discuss the structure of the plan and I will provide you with an outline through Moodle2. The length of the document is maximum 25 pages. The draft of the document is due on November 16! You will receive written comments from me within a week. The final document is due on December 15. I suggest you emphasize the following topics:

**Concept**

a) What problem are you solving? Where did the idea come from? Explain what the market opportunity is and what your solution might be. What makes your solution particularly compelling?

b) Do you have personal experiences with this market? Is there existing intellectual property that you must license or new intellectual property you must develop in order to pursue this opportunity?

c) Has anyone tried something like this before? If so, why did they fail or succeed, and why is the opportunity still attractive?

**Market Analysis**

d) What industry are you addressing? Why is this market attractive? What segment of the overall market are you pursuing? What market research data can be gathered to describe this market need? What are the total industry or category sales over the past three years? What is the anticipated growth for this industry? If this is a new market, what is the best analogous market data that illustrates the opportunity? Project the potential market size and growth for your opportunity.

e) Customers. You need to have a clear idea of who your target customer is. What does the customer need? Why does the customer need it? What is the customer using today? What is the customer willing to pay for your solution? Why? How will you reach this customer? You should include both primary research and secondary research, emphasizing primary over secondary. One suggestion that is often very illuminating is to consider a day-in-the-life of the target customer and how your solution will impact that scenario.

e) Competition. Who else serves this customer need? Who might attempt to serve this market in the future? What advantages and weaknesses do these competitors and would-be competitors have? What share of the market do specific competitors serve? Are the major competitors' sales growing, declining, or steady? What are the barriers to entry for you? What are the barriers to entry for additional competitors?

**Implementation**

f) Partners and Allies. Small companies cannot do everything. Which companies or organizations will help you achieve your goals? What value will your partners contribute? What value will you bring to your partners? How will you align your interests with those of your partners?
g) Business Model. How do you intend to make money and grow the business? Is this an original business model or is it similar to another business? What products or services would you develop to seize this opportunity? How much will people pay for your solution? How will you grow revenues and profits over time? What are your principle expenses? How can they be managed? What investments are required to pursue the opportunity to profitability and how would you stage them?

h) Risk. Of financial, technical, people, and market risks; which one is of most concern? Which would you choose to address first and why? How would you manage or minimize each of the risks going forward? Please note that the list above has no implied order. Some entrepreneurs start with a well-defined concept and then try to identify a market for their idea; others start by studying a market and then stumble upon an idea. Also, please keep in mind that the specific data and information you provide will vary according to the type of opportunity you choose to analyze.

i) Detailed financial analysis is optional.

Criteria for the evaluation of the business plan will be posted on Moodle as a separate document. Evaluation criteria for your presentations are the following:

- Substance of Presentation (20%)
- Covered topic well (10%)
- Clarity: Audibility, wording, flow of ideas, pace of delivery (10%)
- Persuasiveness: Credibility, eye contact, conviction, etc. (10%)
- Use of visual aids: Key points emphasized, clarity and readability, interaction with visual aids (10%)
- Information clearly organized (10%)
- Management of time (10%)
- Equal division of presentation material (10%)
- Ability to answer questions, think on feet (10%)

The Group Process
First and foremost, take your role within the team seriously. You should aim to integrate the various viewpoints and simultaneously make the best possible use of the different analytical skills of the group members. A creative group process builds upon resolving diverse views in arriving at a synthesized whole. One method for achieving this result is to first have each group member work individually, then meet as a group and verbally decide on the group's collective judgments. You should decide on a specific group process for drafting, writing, and editing the final document. An important part of this process may involve giving one or two group members the authority to edit and pull the final document together, in the interests of generating a cohesive document.
# Date | Topic | Readings (R) /Cases(C) | Hand-in (H)/In-class activity (I)/Presentation (P)
---|---|---|---
1 | Sept. 5, Wed. | Introductions, course overview, defining entrepreneurship | R: Syllabus
2 | Sept. 10, Mon. | Entrepreneurship and Me: Am I cut out to be an entrepreneur? | R: Ch. 1 C: Barbara’s options (mini-case)
3 | Sept. 12, Wed. | Opportunity and idea generation (Brief intro to case method) | R: How to read financial stat. (Moodle) R: Case method (Moodle) R: Ch. 2.1, 2.2 Note: Due to the length of the “How to read a financial statement”, you can spread out the reading of the handout over the sessions 3-5.
4 | Sept. 17, Mon. | Technological opportunities | C: Trexel
5 | Sept. 19, Wed. | Knowledge and intellectual property | R: Ch. 9, 10.3-10.8 R: TTO Guidebook GUEST: (OTC) H: 10 ideas in journal
6 | Sept. 24, Mon. | University lab and commercialization | C: Langer’s Lab (HBS)
7 | Sept. 26, Wed. | Opportunity evaluation | R: Ch. 2.3-2.6, 6.1 R: George Day (HBR article) P: Top idea (2-3 min) - individually
8 | Oct. 1, Mon. | Opportunity evaluation, NPV Analysis | R: Slides I: Teams are set
9 | Oct. 3, Wed. | Business model | R: Ch. 3 C: Biodiesel
10 | Oct. 8, Mon. | No class – Teams work on projects or guest lecture | |
11 | Oct. 10, Wed. | Industry analysis | R: Ch. 4.1-4.7 Ch. 5 GUEST
12 | Oct. 15, Mon. | Competitive advantage | R: Ch. 6.2 – 6.3 C: Yahoo!
13 | Oct. 17, Wed. | Marketing Strategy & Review for Mid-Term | R: Ch. 11 R: Sample exam
14 | Oct. 22, Mon. | MID-TERM | |
15 | Oct. 24, Wed. | Legal form | R: Ch. 10 (relevant sections) GUEST: Chris Smith
16 | Oct. 29, Mon. | Social entrepreneurship | R: Ch 8.1-8.2 C: $100 laptop (HBS)
17 | Oct. 31, Wed. | Business Plan | R: Ch. 7 R: Sahlman’s article
18 | Nov. 5, Mon. | OPPORTUNITY ANALYSIS | P: Opportunity presentations
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<tr>
<th>Date</th>
<th>Day</th>
<th>Topic</th>
<th>Reading Notes</th>
<th>Notes</th>
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<tbody>
<tr>
<td>19 Nov.</td>
<td>Wed.</td>
<td>Financial Projections</td>
<td>R: Ch 16.1-16.4, 17.8 (review the rest of chapter 17)</td>
<td>C: Artemis</td>
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<tr>
<td>20 Nov.</td>
<td>Mon.</td>
<td>Due Diligence</td>
<td>C: Walnut Venture Associates</td>
<td>Reading on Moodle</td>
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<tr>
<td>21 Nov.</td>
<td>Wed.</td>
<td>Valuation, Sources and Bootstrapping</td>
<td>R: Ch 18</td>
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<td>22 Nov.</td>
<td>Mon.</td>
<td>Valuation</td>
<td>C: Neverfail Computing (HBS)</td>
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<tr>
<td>23 Nov.</td>
<td>Wed.</td>
<td>TEAMS WORK ON PROJECTS – NO CLASS (EMAIL DRAFT)</td>
<td>R: Ch. 13.7, 14.1-14.2 C: Sirtris</td>
<td>GUEST 3</td>
</tr>
<tr>
<td>24 Nov.</td>
<td>Mon.</td>
<td>Entrepreneurial operations</td>
<td>R: Ch. 13.7, 14.1-14.2 C: Sirtris</td>
<td></td>
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<tr>
<td>25 Nov.</td>
<td>Wed.</td>
<td>Entrepreneurship, Intrapreneurship and Employee entrepreneurship</td>
<td>R: Ch. 8 (except 8.2)</td>
<td></td>
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<tr>
<td>26 Dec.</td>
<td>Mon.</td>
<td>Founding team and Boards</td>
<td>R: Ch. 12 C: Solid Works</td>
<td></td>
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<tr>
<td>28 Dec.</td>
<td>Mon.</td>
<td>Deal making and negotiation, Summary and review for final</td>
<td>R: Ch. 19 R: Note on Term Sheets, pp. 1-34</td>
<td></td>
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<tr>
<td>29 Dec.</td>
<td>Wed.</td>
<td>PRESENTATIONS</td>
<td>Business plan due (External Judge)</td>
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<td>30 Dec.</td>
<td>Mon.</td>
<td>FINAL EXAM</td>
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