GNG4120: Technology entrepreneurship for engineers and computer scientists

Course description
The aim of the course is to provide hands-on introduction to the many dimensions of starting and growing a technology company. Students will develop a clear understanding on how to evaluate market opportunities, design profitable business models, raise capital, develop a product that customers need and build a winning team. Students will gain the skills and tools to turn technical ideas into profitable sustainable businesses. The course provides the student the opportunity to develop his/her own business plan based on the material provided in the course. In addition, a number of entrepreneurs and venture capitalists will be invited to give their first hand experiences. The course is particularly suited for students wanting to become entrepreneurs as well as anyone who expects to manage people in their business careers.

Course outline

Week 1: Introduction to Entrepreneurship
- **Background material:**
  - The Innovator’s DNA (Clayton Christenson)
- **Assigned reading material:** How Venture Capitalists Evaluate Potential Venture Opportunities
  Michael J. Roberts, Lauren Barley

Week 2: Opportunity identification
- **Background material**
  - Describing the value proposition
  - Framework for opportunity assessment
  - Evaluating a business idea
- **Guest speaker 1**
- **Project deliverable (A): Technology idea (Presentation)**
  Description: In a maximum 2-minute presentation, class participants will be given an opportunity to introduce themselves and share with other students their ideas. The objective is to attract 2-3 other students to join your team.

Week 3: Managing the early stage venture: Pre-launch considerations
- **Background material**
  - The legal protection of Intellectual property
  - The legal form of an organization
- **Guest speaker 2**
- **Case study 1: Ajay Bam, #BAB070-PDF-ENG (2%)**
  Description: Deals with a nascent, high-potential business that is conceived by two MBA students who have no experience in the industry where they believe they have found a niche for an exciting new product--a technology platform that enables consumers to pay for merchandise and simultaneously participate in loyalty programs using any type of cell phone. Deals primarily with building contacts and gathering resources. Also covers career choice, building a team, venture capital, and boards of advisers.
• **Project deliverable (B): Team Formation**
  Description: Teams of 3-4 have been formed and contact information for all team members has been e-mailed to me.
  You should select your team carefully as you are making a commitment for the whole term and possibly longer.
  Submission Requirement: Each team should send me the name of the proposed start-up as well as the names, e-mail addresses, background and experiences of the team.

**Week 4**: Managing the early stage venture: Pre-launch considerations (cont.)

**Background material**
- The impact of financing models on business evolution
- Assembling human resources

**Guest speaker 3**

**Case study 2: Eink: financing growth, #5-802-139 (2%)**
  **Description**: A set of financial and strategic decisions confront the management of a company trying to develop a technology for creating "electronic ink." If successful, the company will be able to create "radio paper," essentially turning a piece of paper into a computer monitor that has all the characteristics of paper but is digitally controlled.

  **Learning objective**: To explore issues about how to finance such a high-technology venture.

**Week 5 (Oct. 4th)** Marketing

**Guest speaker 4**

**Background material**
- Market research for entrepreneurs (market size, opportunity, segment, competitive advantage, product positioning, pricing)
- Disruptive versus sustaining innovations

**Case study 3: Innovation at 3M (lead user method) (2%)**
- **DESCRIPTION**: Describes how 3M Corp. introduces and learns a new and innovative methodology called Lead User research to understand future customer and market needs. A team from 3M's Medical-Surgical Markets Division applies the Lead User methodology to the field of surgical infection control and discovers not only new product concepts but also a very promising new business strategy. Focuses on: (1) 3M's approach to the management of innovation and understanding market needs, (2) an in-depth description of the Lead User method and its potential as applied to the medical business, and (3) the managerial challenges of introducing novel methods into a successful organization.

  **Learning objective**: To learn how to introduce and conduct Lead User research to understand future customer and market needs. Also, to discuss the potential of customer input in innovation strategy formulation.
Week 6th (Marketing cont.)

Background material
- Business models
- Brand management, anything missing in marketing
- Guest speaker 5

Case study4: Zipcar: refining the business model, Product 803096-PDF-ENG (2%)

DESCRIPTION: Zipcar is a start-up organized around the idea of "sharing" car usage via a membership organization. This case describes several iterations of the Zipcar business model and financial plan. These iterations include a very early version and a version developed just prior to the launch of the business, as well as data from the first few months of operations. Students are called on to analyze the underlying economics and business model for the venture and to discover how these assumptions are holding up as the business is actually rolled out.

Learning objective: To understand the notion of a business model and unit economics and flow through the impact of actual operating results

Project deliverable (C): Concept Submission (5%)

Description: Each team will be working on a business plan. The team is asked to submit a brief description of the venture concept that should include:
- A brief explanation of the unfulfilled need that will be satisfied, (what problem are you solving? For whom? )
- A brief description of the product/service concept (how will you solve the problem? what is the value proposition?)
- A brief description of the business and revenue models (i.e. how will you create and capture value)
- A brief rundown of the key concerns or risks

Submission requirement: The submission should be up to three pages

Feedback will be provided before study week.

Week 7 midterm (case study, 20%)

Week 8 study week

Week 9, (sales management)

Background

- Designing and organizing a sales force (taking the fear OUT OF sales , CREATING A WILLING BUYER)
- Account management
- Expansion of sales team

Guest speaker 6

Project deliverable D: Company, Market & Strategy Sections presentation (5%)

Description: The presentation is 5 min. per group. The purpose of this presentation is twofold. First, it should demonstrate the progress the team has made on some of the most critical parts of the business plan. Second, the team will receive detailed feedback to help in the final presentation.

Week 10 (Finance)
Case study 5: Netflix, 607138-PDF-ENG

DESCRIPTION: Reed Hastings founded Netflix with a vision to provide a home movie service that would do a better job satisfying customers than the traditional retail rental model. But as it encouraged challenges it underwent several major strategy shifts, ultimately developing a business model and an operational strategy that were highly disruptive to retail video rental chains. The combination of a large national inventory, a recommendation system that drove viewership across the broad catalog, and a large customer base made Netflix a force to be reckoned with, especially as a distribution channel for lower-profile and independent films. Blockbuster, the nation's largest retail video rental firm, was initially slow to respond, but ultimately rolled out a hybrid retail/online response in the form of Blockbuster Online. Aggressive pricing pulled in subscribers, but at a price to both it and Netflix. But a new challenge was on the horizon: video-on-demand. How should Netflix respond?

Learning objective: To support a discussion on disruptive vs. sustaining innovations, examine jobs-bases segmentation, and look at emergent strategy development.

Week 11 (Growing the organization into a sustainable business)

- **Background**
  - Corporate culture
  - Teamwork/dynamics
  - Keeping employees
  - Leadership and management

- **Guest speaker 7**
- **Case study 6**: Finance related (TBD, 2%)

Week 12, (product development)

- **Background**
  - Taking the technology from the lab to the market place
  - Product development process
  - Resources issues

- **Guest speaker 8**
- **Case study 7**: Nantucket nectars (2%)

Description: The founders of Nantucket Nectars are trying to decide whether to sell their company. The case describes how the founders started the company and grew the Nantucket Nectars brand name.

Learning objective: To examine guerrilla marketing, and the development of a brand, to analyze when to think about selling a brand.

Week 13,
Project deliverable (E): business plan presentation (15%)
Description: Teams will make a formal presentation of the final business plan
Submission Requirements: 15 min. Presentation followed by 5 min. Feedback. Based on feedback

Final exam (30%)

Project deliverable (F): business plan submission (10%)
Description: Based on my feedback and the class feedback, teams write a formal detailed business plan.

Grading: Case studies (10%), class participation (10%), midterm (20%), final exam (30%), and a final project (30%). The final project will be a written report on developing a business plan.