VENTURE ENGINEERING
SPRING 2016
W 7:00 – 10:00 PM
Building 3-370

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This course provides an integrated approach to the development and growth of new innovative ventures. The course is intended for MIT undergraduates who seek to leverage their engineering and science background through innovation-driven entrepreneurship. A central theme of the course is that innovation-driven entrepreneurs must make a set of interdependent choices under conditions of high uncertainty, and thus venture engineering involves reducing uncertainty through a structured process of experimental learning and staged commitments. The course is structured to provide deep understanding of the core technical, customer, and strategic choices and challenges facing start-up innovators, and a synthetic framework for the development and implementation of ventures in dynamic environments.
CLASS BACKGROUND AND PREPARATION

The course is intended for undergraduates with a strong technical background but does not assume prior business or management experience. The course is highly complementary to and serves as a strong foundation for a range of innovation and entrepreneurship courses around MIT. The course is particularly appropriate for students with a strong technical background who would like to found or join a start-up company at some point in their career.

The course combines interactive as well as online lectures, structured case analyses, and team projects. The course leverages both academic research and practical understanding of the challenges in (and state-of-the-art of) venture engineering. The assignments and team project offer an opportunity to integrate and apply the venture engineering framework in a practical way, and draws from a diverse range of engineering disciplines and settings. Students should be prepared for every class. The class is highly interactive.

Each student will be part of a team that will be responsible for considering alternative commercialization paths for an idea at multiple stages of the venture engineering process. For each stage of this team project, you will be comparing venture design alternatives, and developing insight into the core data and learning process that guide specific choices and commitments.

The class will both use Stellar and MITx extensively. The materials on these sites are critical to the course and include readings, online lectures, analytic tools, as well as points of more general interest.

CLASS REQUIREMENTS, GRADING, AND DUE DATES

- **Active Class & Group Participation (30%).** Participation consists of 3 components:
  - **Class Environment (10%).** For each class, each student is expected to prepare pre-class exercises, readings and case studies, listen closely to class discussion, and share their ideas. Class will begin on time. Repeated lateness will count against the class participation grade. Though absence is discouraged, please inform the TAs in advance if an absence is required.
  - **Required Online and Pre-Class Exercises (15%).** Throughout the class, there are a number of online and pre-class exercises to be conducted either individually or by team. Except where noted, these exercises are ungraded but mandatory.
  - **360 Group Evaluation (5%).** Each group member will be evaluated by all group members at the end of the quarter. Evidence that group work has been unevenly completed will count against the class participation grade.

- **Individual Case Write-Up (15%).** Each student will be responsible for one case write-up that focus on particular venture design choices facing real-world entrepreneurs. The objectives of the case write-ups will be to use the class framework and tools to develop an analysis of the key choice facing the founder. Each case write-up will involve the development of a practical recommendation to the founding team.

- **Team Project (55%).** Each team will consist of 4 students who will focus on three specific venture engineering choices over the courses of the semester. Each assignment will focus on the development of venture design alternatives, an analysis of the data gathering and learning process that would be required to make a concrete decision, and the development of a preliminary recommendation based on available data and information. The first two presentations will each count for 15% of the grade, and the final presentation will count for 25% of the grade.
**CORE TEXTS:**


### COURSE OVERVIEW

<table>
<thead>
<tr>
<th>Date</th>
<th>Class Topic</th>
<th>Main Readings</th>
<th>Homework Due</th>
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<tbody>
<tr>
<td>Feb 10</td>
<td>The Process of Innovation, Part I</td>
<td>Fitzgerald, Wankerl and Schramm (FWS), Chapters 1-4</td>
<td>Team Formation Due (ungraded)</td>
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<td>Feb 17</td>
<td>The Process of Innovation, Part II</td>
<td>FWS, Chapter 5</td>
<td>Project Idea Selection Slide Due (ungraded)</td>
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<td>Feb 24</td>
<td>Innovation Thinking and Research</td>
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<td>Mar 9</td>
<td>Primary Market Research</td>
<td>Talking to Humans</td>
<td>Build a Market Segmentation Matrix (ungraded)</td>
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<td>Mar 16</td>
<td>Choosing your Customer</td>
<td>GS Chapter 3, Choosing your Customer</td>
<td>15 Customer Interviews (ungraded)</td>
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<td>Mar 23</td>
<td>NO CLASS – SPRING BREAK!</td>
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<td>Mar 30</td>
<td>Beachhead Market Presentation</td>
<td>Review Aulet, DE, pp. 41-138</td>
<td>Beachhead Market Presentation (15%)</td>
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<td>Apr 6</td>
<td>The Foundations of Venture Design</td>
<td>GS, Chapter 5, Choosing Your Identity</td>
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<td>CASE: Clover</td>
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<td>Apr 13</td>
<td>Foundations of Venture Strategy</td>
<td>GS, Chapter 6, Choosing your Entrepreneurial Strategy</td>
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<td>Apr 20</td>
<td>Choosing your Implementation Path</td>
<td>CASE: Avatech</td>
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<td>Apr 27</td>
<td>Scaling Your Venture</td>
<td>CASE: Ministry of Supply</td>
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<td>May 4</td>
<td>Entrepreneurial Strategy Final Presentation</td>
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<td>Venture Design and Strategy Final Presentation</td>
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<td>May 11</td>
<td>What Do I Do Now?</td>
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