EAS028: Management & Technology Summer Institute
Technology, Innovation and Venture Development
Syllabus • Summer 2009

I. CONTACT INFORMATION

Professor Jeffrey Babin
Senior Lecturer & Associate Director
Engineering Entrepreneurship

Mr. Siddharth Deliwala
ESE Labs/CBE Labs

II. COURSE DESCRIPTION

This course is designed to provide an introduction to technological concepts, business/management principles and technological innovation strategies. Students will:

- Learn about the integration of management principles and technological concepts.
- Gain exposure to core engineering, including bioengineering, computer science, chemical, electrical, material science and mechanical engineering.
- Gain exposure to core business disciplines, including accounting, finance, management, marketing, statistics, and operations and information management.
- Develop a "go to market" plan for a high technology product idea and present the concept to a group of "customers" and "distributors" at a "new product fair"
- Work in teams on group projects and case studies
- Discover Penn, and the city of Philadelphia.
- Find out about academic and career choices in the fields of engineering and business

The course includes co-curricular activities—such as corporate and R&D lab site visits—that will be incorporated into the academic work conducted in the classroom.

III. COURSE PREREQUISITES

The course is designed for high school students of rising senior standing.

IV. COURSE MATERIALS

A bulkpack comprising cases and articles is required for the class and will be provided before the first session.

V. COURSE LOGISTICS AND ASSIGNMENTS

Blackboard

The class website or Blackboard may be accessed from https://courseweb.library.upenn.edu/. Please refer to this site frequently for supplementary readings, class assignments, announcements, and other important information regarding the class.

Grading

This course will be taught in seminar fashion with substantial class discussion. Thorough preparation and active class participation and attendance are essential. Assigned and supplementary readings will be augmented by cases and occasional guest lectures. Assigned materials can be found on the syllabus underlined.

Grades will be determined as follows:

Class Attendance and Participation	20%
Lab Write-ups and data analyses	20%
Case Studies, Quizzes, and other Individual Assignments	30%
Team Go to Market Plan	15%
Team Presentation	15%
Total Grade	100%

Written assignments are to be word processed, and turned in at the *start of the class* on the date they are due. Late papers (anything after the start of class) are not accepted (except in the case of documented incapacity or emergency). There will be no regrading of papers.

Class Attendance and Participation

EAS028 is a class discussion course. Your class participation is essential for your own benefit, as well as that of other students. If you are concerned about participating, you should discuss this with the professor. Unexcused absences will negatively impact your total grade. During this summer session, we meet for only 3 weeks. Therefore, missing even one class is significant.

Class attendance (including arriving on-time to class) is a critical component to the course. You should review known absences at the ***beginning*** of the session with your professor; however, excused absences are limited to religious holidays and medical or family emergencies. Professional events, sporting events, extended vacations, or other personal preferences will not count as excused absences. Excused absences for illness require a physician's note. It is fully expected that students also arrive on time to class out of respect for your professor, and classmates. Lateness to class will also negatively impact your total grade.

Guest lectures are an important part of the learning experience. Please respect the contributions of our guest lecturers by researching their companies prior to class. Each guest lecturer will share their experiences and provide time for questions and answers. Please prepare questions in advance according to the guidelines provided. Please arrive promptly for any visits to guest locations.

Lab Write Ups

The main purpose for Lab reports is to communicate the results to others and to enable others to duplicate the work in a straight forward manner. Guidelines will be provided for preparing for labs and developing lab reports.

Additional information on labs and visits can be found at http://www.seas.upenn.edu/~mtsi/.

Case Studies, Quizzes, and Other Individual Assignments

Quizzes will also be a component of the class designed to stimulate discussion on the assigned reading materials. Quizzes will be closed book/case; however, students may use personal notes taken during the process of preparing for class.

In addition, selected classes will have case analysis or other written assignments, due at the beginning of class, covering the assigned material. Case analyses will address a specific question or set of questions that will be provided. Focus on making your case analysis and assignments insightful and concise.

Team Go to Market Plan

Team work is an essential part of technological innovation. Teams develop and refine product ideas as well as share in the efforts required to analyze and investigate markets. EAS028 students will work collaboratively as part of a team of 4-5 students on several assignments. Teams will be formed in the first class and will be active throughout the course.

Team Presentation

Students will receive individual feedback and evaluation throughout the course. The culmination of the course will include a "Product Fair" where students and other reviewers will evaluate each group's project and provide feedback. Students will receive overall performance evaluations (focused on demonstrated creativity, innovation, interpersonal skills, teamwork and leadership) from program faculty/coordinators as well as a certificate indicating successful completion of the Institute.

EAS028: Management & Technology Summer Institute
Syllabus

Date	Lecture Topic(s)/Lecturers	Readings and Assignments
Week 1	Core Concept foundations	
Monday, July 13		
9:00-9:50am JMHH 240	1. Course Overview Professor Jeffrey Babin • Instructor and course introduction • Course objectives and syllabus	• Syllabus • Case Method Overview
10:00am JMHH 240	The Nature of Technological Innovation Dr. William F. Hamilton, Director, Fisher Program in Management & Technology	• This Way to the Future • Innovation in Industry • 10 Emerging Technologies 2008
2:00-2:50pm JMHH 240	What is Business? Dr. Georgette Chapman Phillips, Vice Dean, The Wharton School	
3:00pm-4:00pm Wu and Chen Auditorium	What is Engineering? Dr. Eduardo Glandt, Dean, Penn Engineering	
4:00-5:00pm Wu and Chen Auditorium	Engineering Introduction Siddharth Deliwala	
6:30pm Departure Boathouse Room, Rittenhouse Hotel	Welcome Dinner M&T Summer Institute Julian Krinsky Summer Programs	
Tuesday, July 14		
9:00am JMHH 240	2. Business Case Study Analysis Professor Jeffrey Babin • Introduction to marketing concepts • Case review and analysis • Case write-ups	• Case Method Overview • CASE: *Space Data Corporation* (HBS 9-602-121)
10:30-11:50am JMHH 240	3. Idea Generation & Evaluation Professor Jeffrey Babin • Describe procedures and sources for finding ideas • Use group process techniques to generate & evaluate ideas • Identify critical elements of a "good idea"	• Team Project: 10 candidate concepts
2:00pm Wu and Chen Auditorium	Introduction to Bioengineering Dr. Beth Winkelstein, Assistant Professor of Bioengineering, Penn Engineering	
2:30pm Wu and Chen Auditorium	Bioengineering Lab Quiz – open notes	
2:45pm Wu and Chen Auditorium	BE Lab Introduction: Electromyography, Goniometry and Reflex Response Siddharth Deliwala Sevile Mannickarottu, BE Instruction Lab Coordinator	
3:15-5:30pm Undergraduate BE Lab, 2nd Floor Skirkanich Hall	BE Lab: Electromyography, Goniometry, and Reflex Response Siddharth Deliwala Sevile Mannickarottu	• The class will be split into two groups – half will do Programming, other half will do BE and then switch
3:15-5:30pm	Programming Lab	• The class will be split into two groups – half

Date	Lecture Topic(s)/Lecturers	Readings and Assignments
Ketterer Lab, Room 204 Moore Bldg	Siddharth Deliwala	will do Programming, other half will do BE and then switch
Wednesday, July 15		
9:00am JMHH 240	4. Product Design & Development Processes Professor Jeffrey Babin • Describe integrated product development methodologies & tools • Discuss the importance of rapid, iterative product development cycles	• CASE: IDEO Product Development (HBS 9-600-143)
11am JMHH 240	Technology Adoption Lifecycle & Chasm Concepts Professor Jeffrey Babin	
11:30am-12:00pm JMHH 240	IDEO Video viewing Professor Jeffrey Babin	
2:00pm Wu and Chen Auditorium	Electrical Engineering Dr. Dan Lee, Associate Professor of Electrical and Systems Engineering, Penn Engineering	
2:30-4:00pm Ketterer Lab, Room 205 Moore Bldg	MEAM Lab	
4:00-5:00pm JMHH 240	5. Business Models & Product Strategy I Professor Jeffrey Babin/Rob Weber • Review Technology Adoption Lifecycle framework • Contrast alternative business models • Evaluate and select market opportunities • Discuss competitive analysis methods • Identify critical customers for product, product differentiation, and product positioning	• *Note on Business Model Analysis for the Entrepreneur* (HBS 9-802-048) • Crossing the Chasm, Geoffrey Moore, Ch 4, *Target the Point of Attack* • *Teaching note on Products, Markets, Competencies* • CASE: PVI/ENSONIQ, Parts (A) (B) & (C)
Thursday, July 16		
9:00-10:30am JMHH 240	6. Segmentation & Positioning Professor Jeffrey Babin • Introduce concepts of Web 2.0 and social networking. • Identify criteria and characteristics to define market segments. • Evaluate preferences and perceptions of market segments. • Determine purchase behavior patterns that define and differentiate market segments. • Use segmentation characteristics to differentiate products/services from competitive offerings.	• *Market Segmentation, Target Market Selection, and Positioning* (HBS 9-506-019) • CASE: *Facebook* (Stanford E220) • CASE: *LinkedIn A* (HBS 9-707-406)
1:00-2:00pm JMHH 240	Introduction to Marketing Dr. Peter Fader, Professor of Marketing, The Wharton School	
2:30-6:30pm Ketterer Lab, Room 204 Moore Bldg	Programming Lab I Siddharth Deliwala	
8:00pm Quad	Workshop: Business Case Study Feedback RTA's	

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Friday, July 17		
9:00am-1:00pm Houston Hall, Hall of Flags	Business Simulation: Survey of Business Principles and Disciplines Lara Azzam and Andre van der Bergh, Team Business	
2:00pm JMHH 240	Innovation Field Trip: Bressler Group Peter Bressler, Principal	• www.bresslergroup.com

Date	Lecture Topic(s)/Lecturers	Readings and Assignments
Week 2	Advanced Concepts - Management & Technological Innovation Integration	
Monday, July 20		
9:00am JMHH 240	7. Market Research & Product Testing Professor Jeffrey Babin • Review tools and techniques for market research • Refine product concepts in response to market feedback • Identify customer value proposition and mechanisms for measuring value • Discuss attribute maps, consumption chain analysis • Review the product development and new drug/device development and approval processes (in preparation for CardioThoracic Systems and trip to Synthes)	• Market Busters, McGrath & MacMillan, (HBS Press, 2005) - Ch 2, *Transform Your Customers' Experience* - Ch 3, *Transform Your Offerings and Their Attributes*
10:30-12:00pm JMHH 240	8. Business Models & Product Strategy II -- Lifesciences Professor Jeffrey Babin • Describe potential value chains and product's role & impact on it • Evaluate Whole Product Solution planning • Identify unique challenges in product development and marketing strategy in regulated (specifically, lifescience) markets • Describe stakeholders in healthcare and lifesciences and evaluate value propositions for each. • Evaluate adoption challenges for medical device and lifescience products.	• Crossing the Chasm, Ch 5, *Assemble the Invasion Force* • CASE: *CardioThoracic Systems* (HBS #5-503-092)
2:00pm Wu and Chen Auditorium	Materials Science and Engineering Lab Steve Szewczyk, MSE Lab Instruction Coordinator	
4:00-4:30pm Wu and Chen Auditorium	Computer and Information Science Dr. Norm Badler, Professor of Computer and Information Science, Penn Engineering	
Tuesday, July 21		
7:30am Departure 851 Duportail Rd Wayne, PA	Innovation Field Trip: Traffic.com Chris Rothey, COO, Traffic.com (M&T '95) • Investigate product development and marketing launch plans in action • Interact with product and marketing teams	• www.traffic.com • CASE: Mobility Technologies • Traffic.com questions
1:30pm TBD	Tentative Engineering Session Siddharth Deliwala	
2:00-5:00pm JMHH 240	Feedback Session on Venture Ideas and Plans Professor Jeffrey Babin Siddharth Deliwala • Product Launch Plan	

Date	Lecture Topic(s)/Lecturers	Readings and Assignments
Wednesday, July 22		
9:00am JMHH 240	9. Business Models & Product Strategy III Professor Jeffrey Babin • Identify critical economic drivers for both revenue and cost • Contrast alternative business models	• *Blue Ocean Strategy*, Kim & Mauborne (HBR #R0410D) • CASE: Google, Inc. (HBS 9-806-105)
10:30am-12:00pm JMHH 240	External Sources of Innovation Dr. Saikat Chaudhuri (M&T '97), Assistant Professor of Management, The Wharton School • External innovation strategies: acquisitions, corporate ventures, alliances, outsourcing	
2:00-2:30pm Wu and Chen Auditorium	Mechanical Engineering and Applied Mechanics Dr. Mark Yim, Associate Professor of Mechanical Engineering and Applied Mechanics, Penn Engineering	
2:45-3:15pm Wu and Chen Auditorium	Systems Engineering Dr. Dan Koditschek, Professor of Electrical and Systems Engineering, Penn Engineering	
3:30-6:00pm Presentation: Wu and Chen Lab: Moore 101	ESE Lab Siddharth Deliwala	
Thursday, July 23		
9:00am JMHH 240	10. Marketing & Distribution Channels Professor Jeffrey Babin • Describe methods for demand generation and sales pipeline management • Develop strategy to bring product/service to customer base • Define methods for crafting an effective marketing message • Describe techniques for creating buzz • Develop mechanisms for reinforcing marketing message	• CASE: *Research in Motion* (Ivey 9A99A036)
10:30-11:30am JMHH 240	11. Product Launch Plan Strategies and Tactics Professor Jeffrey Babin • Review positioning concepts • Discuss product and market offerings • Discuss product launch strategies and issues	• CASE: *TiVo* (HBS 9-501-038)
1:00-2:00pm JMHH 240	Window on Innovation: Finance and Financial Markets Professor Jeffrey Babin	
2:00-4:00pm Room 204, Moore School	Programming Lab II Siddharth Deliwala	
4:00-5:00pm TBD	Team Technical Review (By Appointment)	

Date	Lecture Topic(s)/Lecturers	Readings and Assignments
Friday, July 24		
7:30am Departure 1301 Goshen Parkway, West Chester, PA	Innovation Field Trip: Synthes Corporation Tina Costantini, HR Manager Mike Sticklin, HR Manager Mark Grady, Senior Product Development Engineer Scott DiDomenico, Sr. Product Development Engineer Ken Kobayashi, Product Development Engineer Chad Morgan, Product Development Engineer	• www.synthes.com • Synthes questions
1:45pm Departure 3601 Market Street Philadelphia, PA	Innovation Field Trip: NeatReceipts Harris Romanoff, Vice-President of Product Development	• www.neatreceipts.com

Date	Lecture Topic(s)/Lecturers	Readings and Assignments
Week 3	Venture Development Process	
Monday, July 27		
9:00am JMHH 240	12. Market Forecasting, Budgeting and Economics Professor Jeffrey Babin • Develop and evaluate market demand forecast models • Develop financial forecasting and ROI analysis models • Create product development and marketing budgets	• CASE: *Rogers Communications* (HBS 9-597-050)
10:30am-12:00pm JMHH 240	Venture Finance Professor Jeffrey Babin	
1:00pm TBD	Tentative Engineering Session Siddharth Deliwala	
10:30am-12:00pm JMHH 240	Feedback Session on Venture Ideas and Plans Professor Jeffrey Babin Siddharth Deliwala • Product Launch Plan	• Draft of Final Presentation • Preliminary "Looks-like" Model
Tuesday, July 28		
2:00pm-2:30pm Heilmeier Hall, Towne Building	Chemical and Biomolecular Engineering Dr. Talid Sinno	
4:00-6:00pm TBD	Team Project Meeting Time / Poster Development Process RTA's	
Wednesday, July 29		
7:00am Departure NYC, NY	Innovation Field Trip: Morgan Stanley Google IPO Case Presentation	• http://www.morganstanley.com/
1:00pm NYC, NY	Innovation Field Trip: NYSE, Deutsche Bank Trading Floor Catherine Lennon, Human Resources, Deutsche Bank Securities Inc	• www.db.com • www.nyse.com
Thursday, July 30		
9:30-10:30am JMHH 240	Admissions Q&A Cat McManus, Regional Admissions Director, Undergraduate Admissions	
4:00pm Weiss Tech House, 2nd Fl, GRW/Moore School	Weiss Tech House Visit Anne Stamer, Director, Weiss Tech House Overview and tour with current M&T student	
4:30-6:30pm TBD	Poster Assembly Process Siddharth Deliwala	• Assemble Posters

Date	Lecture Topic(s)/Lecturers	Readings and Assignments
Friday, July 31		
9:00-11:30am TBD	Team Project Development	
1:00pm JMHH G06 Ambani Auditorium	Team Presentations Go to Market Presentations	• Team Go to Market Plans • Team Presentations • Final Looks-like Model • Final Go to Market Posters
3:00pm JMHH Baker Forum	Product Fair	
5:00pm Woodlands Ballroom, Inn at Penn	Closing Dinner	

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1. This Way to the Future
2. Innovation in Industry
3. Case Method Overview
4. CASE: *Space Data Corporation* (HBS 9-602-121)
5. CASE: *IDEO Product Development* (HBS 9-600-143)
6. Crossing the Chasm, Geoffrey Moore, Ch 4, *Target the Point of Attack* (Harper Collins, 1999)
7. Market Segmentation, Target Market Selection, and Positioning (HBS 9-506-019)
8. CASE: *Facebook* (Stanford E220)
9. CASE: *LinkedIn A* (HBS 9-707-406)
10. *Note on Business Model Analysis for the Entrepreneur* (HBS 9-802-048)
11. Teaching note on Products, Markets, Competencies
12. CASE: *PVI/ENSONIQ*, Parts (A) (B) & (C)
13. Market Busters, McGrath & MacMillan, Ch 2, *Transform Your Customers' Experience* (HBS Press, 2005)
14. Market Busters, McGrath & MacMillan, Ch 3, *Transform Your Offerings and Their Attributes* (HBS Press, 2005)
15. CASE: *Google, Inc.* (HBS 9-806-105)
16. Blue Ocean Strategy, Kim & Mauborne (HBR R0410D)
17. Crossing the Chasm, Geoffrey Moore, Ch 5, *Assemble the Invasion Force* (Harper Collins, 1999)
18. CASE: *CardioThoracic Systems* (HBS 5-503-092)
19. CASE: *Mobility Technologies*
20. CASE: *TiVo* (HBS 9-501-038)
21. CASE: *Research in Motion* (Ivey 9A99A036)
22. CASE: *Rogers Communications, Inc.: The Wave* (HBS 9-597-050)