IT 428 – Syllabus

Commercialization of New Technologies
Fall Quarter, 2014, M-W, 8-10,
Meeting Room: 02-206
Office Hours TU/TR-10-11 AM; Or By Appointment

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Purpose of the Course

The world economy has become increasingly smaller through globalization and faster in terms of the pace at which new products and new technologies are introduced by corporations large and small. California has historically been the envy of the world in R&D and the commercialization of new technologies, and the goal of the course is to provide students with a basic understanding of the processes involved, particularly the role that universities play in these processes. The class will be oriented toward the "fuzzy front end" of commercialization, as stakeholders examine the feasibility of incorporating alternative technologies into products and business models. We will also consider the culture and mindset of entrepreneurs (and "intrapreneurs"). You may discover you are one. ***NOTE: You will learn things that will be invaluable if you end up working in a technology-oriented company that is based on innovation and cutting edge science. The vast majority of Cal Poly students, and most faculty members, are not familiar with a lot of what we will cover.***

The Class Mindset

To make the class a more meaningful experience, I would suggest that each of you (particularly in the context of your teams), suspend belief and **envision yourself** as an investment fund (e.g., *Dog Britches Partners*), each of you having 7-figure assets of your own, but your team has also raised a fund of $15-20M mostly from institutional investors. You like to look at university or Federal Laboratory technologies, since you feel these are cutting edge opportunities, despite the fact that university people are sometimes whacky and rude. So, you often proceed by having individual members of your team, working in parallel, peruse technologies for their technical and business potential and make individual written reports. Then you will choose among what's on your plate and devise a more detailed commercialization strategy for one technology. The latter might be either starting a company and taking it to cash flow break even and beyond; alternatively it might focus more on adding value through applied research and product development, and then sell or license to entities that might then take it to market.

Teams will consist of 5-6 students. These will be announced on day one of the quarter. Some player trading permitted.

First Team Mindset Task: Think of a name (not too crazy or obscene) for your team. Also identify two individuals who will be your primary points of contact.

First Organizational Task. Select among your members, two official positions: A CEO or President, who will lead meetings and decision making; a **First Secretary** or **Operations Chief**, who will insure and oversight task accomplishment. Discuss duties and responsibilities and email the instructor what you have decided

How You Get Graded. These learning objectives will be assessed via: (1) objectively scored mind-numbing examinations, midterm and final; (2) an individual "first cut" analysis of a seemingly viable technology (3) a team-based technology feasibility analysis, that will be "fed" by the individual analyses conducted by team members.

Course Format

This will be a "learn-by-doing" class. We will spend about 50% of our time in lectures and discussions of cases and readings; the balance of our time will be spent working on individual analyses and team analyses in class with the instructor roving around and providing guidance and mentoring to individual student papers.

During the 2nd class hour of our two-hour block of time, teams (and the instructor) may often remove themselves to the Ideation Lab (02-206) a room which is very conductive to brainstorming, more energetic discussion, developing crude prototypes, drawing weird pictures and rolling chairs and tables around.

Required Readings and Course Materials

Over the last few years the reading assignments for the class have changed. The readings will include the following Harvard Business Cases and other reprints, which are both informative interesting to read, and useful for stimulating serious discussion in class:

- *Stanford Inventors Guide*
- *Venture Viability Research*
- *The DiagnoFirst Opportunity*
- *Mak vs. Canadian Corn Hybrid Research Institute*
- *The Langer Lab: Commercializing Science*
- *MassMEDIC: The Massachusetts Medical Device Industry Council*
- *Funding Eureka*
- *Elements of a License Agreement*

These have been packaged into a Course Pack and should be purchased at the bookstore ASAP.

In addition, the instructor will be handing out and/or posting various data displays and other no-cost readings in ***PDF*** form on Poly Learn. You will usually get a heads up via email. **Read your email.**

You will also be given handouts over the course that will be important for your team and individual assignments. For example, we may make considerable use of ***The Business Model Canvas*** that will be very helpful in organizing your group and individual assignments.

It will be helpful to **read** a one-pager posted in **Course Materials** on ***How to Read and Analyze a Case Study***. Cases are a very useful instructional but you **must** read them in advance of the class meetings when they are assigned, and they need to be approached with a different mindset.

You will also be responsible for Lecture notes in PowerPoint form, and other handouts, that will be posted on Poly Learn (typically well in advance of class), and students will be responsible for these materials, enriched by our class discussion. Since I walk around a lot when I lecture, you will benefit from having them open on your laptop.

In addition, students may be requested via email to become familiar with various websites over the course of quarter, particularly in the context of team-based assignments. **Read your email.**

Attendance

Attendance is mandatory unless you are a wizard. If a student misses a quiz or graded assignment, without a valid excuse, he/she will receive a reduced or failing grade.

Course Components

Students' grades will largely be composed of the following three components.

1. Individual Feasibility Analysis (33% of Grade). Students will write an analytic technical/business paper that will summarize what they have learned about a technology that has been identified by their team as a finalist (Task 2) in the Team Feasibility Analysis process. The paper will include literature review and/or data as appropriate. Separate handouts will describe expectations about the Individual Early Feasibility Analysis Paper and will be distributed and posted on Blackboard.

Do NOT email a file to print; I will send it back.

This is the halfway point in the class. However, since the Individual Feasibility Analysis papers will be done in parallel by all Team members, and since they are in

effect the "feedstock" for selecting the focus of what will be the Team Feasibility Analysis, there will be ongoing discussion within the team of findings and progress, prior to this date.

In order for you to get an idea of what the **Individual Feasibility Analysis** document will entail, **samples** from previous classes will be posted on **course materials or emailed.**

2. Team Feasibility Analysis (33% of Grade). The team project will involve the development of a comprehensive commercialization feasibility analysis, which will take place after the team has digested and compared the emerging recommendations coming out of team members' Individual Early Feasibility Analysis. Deliverables from the Team Feasibility Analysis will include a **team presentation** and a **written report**. A separate handout will describe expectations about the Team Feasibility Analysis. One-page Task descriptions as well as various analytic tools, each of which will be posted on Blackboard and discussed in class, will guide the Feasibility Analysis. As teams perform these analytic tasks, they will email summaries to the instructor of what they learned and concluded. Individual grading for the Team Feasibility Analysis will reflect both the "group grade" as well as individual contributions, in quantity and quality, to the team effort. The Team Feasibility Analysis **may focus on one technology, or multiple technologies drawn from different schools.**

Project presentations will be conducted during the last two weeks of the quarter. Separate handouts will describe expectations about the Team Feasibility Analyses and will be distributed and posted on Blackboard. **Hard copy** written **team report** copies are due the last **Friday of the quarter at 4 PM in Room 3-405**. Also email a **pdf copy** to the instructor (ltornatz@calpoly.edu).

In order for you to get an idea of what the **Team Feasibility Analysis** document might entail, **samples** from previous classes will be posted on **course materials.**

3. Exams (33% of Grade). Exams will generally encompass two **multiple-choice tests,** one functioning as a midterm, and the second as a final (or late midterm). The nature of the course demands that some key concepts, facts and ideas need to be assessed objectively. The tests are challenging and if you haven't been on top of the readings and assignments, and participated in class, you may not do well. There may **shorter exams** during the quarter as well or instead of the larger midterms. In previous quarters an experimental *Beg Forgiveness and Redemption* final was used (to much acclaim) which allowed students to have another try at the test items that they messed up on during the quarter.

4. Analysis Assistance. Since 2/3 of your grade is tied up in analyses and reports that you produce, students are urged to avail themselves of outside help to track down useful data, reports, credible web sites, etc. In particular, Mr**. Mark Bieraugel** is the new **College of Business librarian**. He has extensive experience in Silicon Valley technology companie skills and background in information search skills runs the gamut from science to markets. He can be reached at 756-6247, Room 216/D, mbieraug@calpoly.edu

5. Grading

Grading scale: total points plus extras will be added up and weighted to produce a grade between 0 and 100 with approximate grade assignments below. I do "curve" at bit but not to an outlandish extent.

A..... 93-100
A- 90-92
B+..... 88-90
B..... 82-87
B- 80-81
C+..... 78-79
C..... 72-77
C-…….. 70-71
D…….62-69
F……..61 and below

Academic Honesty

Students will be expected to honor the letter and spirit of the Cal Poly policies, as specified in the most recent Course Catalog. This includes test taking behavior as well as issues of plagiarism.

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Week-by-Week Overview:

Week of January 6 (2 Sessions-M/W)

- Teams formed; team work begins
- Discussion of class goals and objectives
- Class work engaging NSF databases, Task 1
- Lectures-Introduction to Technology Transfer ***and TTO***
- Read in advance and study: ***Stanford Inventors Guide***. B*e* prepared to discuss

Week of January 13 (2 sessions)

- Team completion of Task 1; send short **email** summarizing your Task 1
- Begin Task 2-***Picking substantive domains, engage technology transfer offices***
- Lectures
- Read in advance and study: ***Venture Viability Research,*** be prepared to discuss

Week of January 20 (2 sessions, T/W) (M-Holiday)

- Read in advance and study: ***The Langer Lab*** be prepared to discuss
- Team work on Task 2, send short **email** summarizing your Task 2 analysis thus far. If at all possible, you should complete Task 2 this week, and start on Task 3
- Other readings as assigned
- Lectures

Week of January 27 (2 session)

- Read in advance and study: ***The Diagno First Opportunity.*** Be prepared to discuss.
- Finalize Task #3-assign individual team members to specific technologies for Individual Feasibility Analyses-Gantt Chart
- Lectures
- Additional assignments as announced
- Individual Feasibility Analyses being conducted; coordinated by Team interaction

Week of February 3 (2 sessions)

- Read and study: ***Mak vs Canadian Hybrid Research Institute*** and *Elements **of a License Agreement***. Be prepared to discuss
- Lectures
- Possible **Midterm** this week
- Additional assignments as announced
- **Individual Feasibility Analysis Papers due on Wednesday, Feb 5 @ 10 AM**

Week of February 10 (2 sessions)

- Read and study: ***Mass MEDIC***, be prepared to discuss
- Parallel work on Team Feasibility Analysis and Individual Feasibility Analyses
- Lectures
- If we didn't have the midterm last week, it will be this week
- Additional assignments as announced

Week of February 17 (1 session, W) M-Holiday

- Read and study: ***Funding Eureka.*** Be prepared to discuss.
- Parallel work on Team Feasibility Analysis and Individual Feasibility Analyses
- Additional assignments as announced

Week of February 25(2 Sessions, MW)

- Issues and progress on Team Feasibility Analyses
- Work on Team Feasibility Analysis; emphasis on ***Business Model Canvas***
- Additional assignments as announced

Week of March 3 (2 sessions) –

- Issues and progress on Team Feasibility Analyses
- Team presentation may begin this week.
- Additional assignments as announced

Week of March 10 (Last week of classes, 2 sessions))

- Presentations of Team Feasibility Analyses, Monday and Wednesday
- Possible wrap up review session
- Unknown stuff
- **Team Feasibility Analysis Papers due on Wednesday, March 13, at 10 AM.**

Week of March 17 (FINALS) - TBA

COB Program-Related Learning Goals:

LG#1: Demonstrate detailed knowledge, skills and perspectives within the area of science-derived technology commercialization
LG#2: Explain and act on ethical issues regarding the commercialization of technology
LG#3: Act upon decision tools and methods in the context of evaluating the prospects and viability of a technology-based venture

COB Learning Objectives: After completion of this course students should have:

- A basic understanding of the science and technology infrastructure of the US – private, public and non-profit
- A basic understanding of how technology transfer works
- A basic understanding of intellectual property processes and their role in technology commercialization
- A basic understanding of what constitutes a opportunity to commercialize a technology, and how that opportunity is verified and elaborated
- A basic understanding of the organizational and human resource issues involved in commercializing a technology, particularly a startup
- An understanding of the public policies and organizational infrastructure that enables technology commercialization and technology transfer
- A demonstrated ability to conduct and produce a technology commercialization feasibility analysis