

MBA 479/779: Special Topics – Technology Commercialization
Dr. Anne York, CU Associate Professor of Entrepreneurship and Strategy
Spring Semester, 2009

Thursdays, 6-9:30 p.m. COBA/Eppley Room BA315

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COURSE GOALS

The goals of the Technology Commercialization course, the first in a two course series in Creighton University's new bioscience entrepreneurship program, are as follows:

- To familiarize students from the science, health science, law, and business disciplines with the bioscience technology commercialization process
- To develop in students an appreciation of the role that teaming plays in successful technology commercialization
- To learn and practice the skills needed to successfully license or develop start-ups from bioscience inventions and research

READINGS/MATERIALS/RESOURCES

Friedman, Yali. 2008. *Building Biotechnology: Business, Regulations, Patents, Law, Politics, Science. Third Edition.* Logos Press: Washington, D.C. Available in the Creighton Book Store in the Harper Center.

Other selected readings and materials will be passed out at the first class; they are noted on the course schedule below.

All of the guest speakers in the course are resources to your teams; please use them! A list of resource emails is posted on the BlueLine course website.

Posted on the BlueLine course website: peer feedback form, resource contact list; CDA; media permission form; table of contents of final report, updated course syllabu, sample licensing agreement.

MULTI-DISCIPLINARY TEAMS

Four multidisciplinary teams will be formed to work on our course project. Each four-person team will consist of at least one law student, health science/science student and business student. While all teams will work on technologies in the same general area and invented by the same person (in this semester's case, telemedicine technologies invented by Dr. Ben Boedeker from UNMC/VA), each team will be assigned a slightly different product and/or market to explore for licensing and/or selling the invention. I will ask

your preferences for the products and markets you would like to investigate, but I will assign the initial teams.

An exercise will take place during the first class where you will have a chance to meet and get to know your fellow team and classmates. It is vitally important that you learn, and decide how best, to communicate successfully with your team members. The difficulty crossing disciplinary boundaries has been identified as one of the top obstacles to success in bioscience entrepreneurship and is a key reason that we are organizing the course in this way.

Additionally, because as students in these disciplines you have quite diverse schedules, flexibility and compromise will be required in scheduling group/team meetings, which are necessary to perform well on the course tasks. While you will be given time at the end of each class to meet with your teams, this will probably not be sufficient to complete the tasks, especially towards the end, when presentations and integration of sections for the final report are required. You will need to identify at least one time that each team member can meet outside of class at least once a week. It is very important that team members be committed to attending these meetings and that they keep team members informed about conflicts ahead of schedule. This means exchanging email addresses, cell phone numbers and any other ways that you prefer to communicate, as well as checking and responding to these sources at least daily.

I am available to help at any point in facilitating the team process, whether that be by sitting in on team meetings, etc., but you'll need to let me know as soon as possible that you would like some help or that your team (or you as an individual) have concerns. Roughly, the last hour of each class is reserved to work on team projects; I strongly urge you to use this time to get the next week's work started, as we are all available to work together at that time.

CLASS FORMAT

Each class will be divided into roughly five parts. The first part will involve a discussion of the readings for the evening. It is important that everyone complete all reading assignments. While some of these will be repetitious for each of you, due to the diversity in disciplines represented in the program, it is imperative that we all be on the same page in order to complete the weekly assignment and to make maximum use of our guest speakers and experts. The second part of class will consist of a guest speaker who will answer questions and discuss key issues related to the topic of the evening. The third part of class (if needed after the assigned readings and guest speakers) will consist of a demonstration of techniques needed to complete the assignment for the next week. Most assignments will involve completing a draft of a section of the final licensing or startup plan for your team project. The fourth part of class will involve a touching base with all students and each team with respect to troubleshooting any problems that are arising in completing the assignments and to share insights and resources that we have found with each other. The fifth and final part of class will provide time for you to begin working on the next week's assignment with your team.

Wireless computer access is available, so please be sure that at least one team member brings a wireless capable laptop to class. I will meet briefly with each team each week to provide feedback on weekly assignments. The more detailed the assignments turned in, the more detailed the feedback can be. The idea is that as you complete the weekly assignments, these will represent sections of the final licensing/startup plan, so that when you reach the end of the course, you can spend most of your time filling in missing details, integrating the reports, and preparing your presentations. A typical expectation for time expended for the course is two hours outside of class for every hour spent in class, which includes research, outside team meetings, class prep, etc. Because our course follows the compressed MBA schedule, we must fit our work into 11 weekly course meetings of 3.5 hours each, with roughly seven outside hours of preparation expected.

GRADING

Class Attendance and Preparation	10%*
Weekly Team Assignments	30%
Individual Journal	10%
Final Team Licensing/Startup Plan	30%
Final Team PowerPoint/Poster Presentation	<u>20%</u>
Total:	100%

You will note that 80% of your course grade is team-related. Because of this, I'll be monitoring team functioning throughout the course which will provide you with a forum to discuss any issues that may arise. However, peer evaluations at the end of the course will determine the individual portion of the team grade (this form is posted on the course BlackBoard website). On this form you will be asked to identify your own and your team members' contributions and rate each. The team outputs will receive a grade; however, individuals may receive different grades other than the team grade based on the quality and quantity of their contributions.

*Please note: more than one unexcused absence (that is, absences not medically excused and not due to official Creighton-sanctioned activities) will result in an F for the course.

ASSIGNMENTS

On the course schedule, the team assignments are listed for the week of each class that they are due. While it is your team's decision how to divide the workload, the team will receive a grade on the assignment rather than the individual. Peer evaluations of each team member's efforts and contributions will be used to assign the final grades in the course. Each assignment is worth approximately 5% of the grade. The more complete the assignment turned in each week, the more detailed the feedback in terms of what needs to be added or improved in the final report. Also, the more complete the assignment, the easier the compilation of the report at the end of the course.

JOURNAL

During the semester, you each will be asked to keep an individual journal of your thoughts about the course process, *especially about your team process*. Note that this journal is not for recording reactions or notes about the articles, although you are welcome to do that as well to help prepare yourself for class discussions. The journals will be due at the end of the course. However, if you identify concerns in your journal or suggestions for improvement as the class continues, we would encourage you to share these during our weekly team meetings so that we can avoid waiting until the end to make mid-course corrections. This is especially important when it comes to team issues, as the success of the projects depends on healthy team functioning, and multi-disciplinary teams are some of the most difficult to manage.

FINAL TEAM LICENSING/STARTUP PLAN

Assuming that each team has made a strong effort in putting together drafts and assignments, the final licensing or start-up plan should be relatively simple. A table of contents will be provided to you, but essentially, you'll be putting together the sections you have done in class, having responded to the feedback provided by your instructors, and providing a references section. The final product should have a consistent format and style of your choosing, so choosing this ahead when you create the drafts will make the combination process easier. You will need a cover page, table of contents, executive summary, required sections on the concept, IP issues, industry and economic trends, target market, competitors (both current and possible future), channels for reaching your market, the licensing vs. startup decision justification, your team and its credentials (including the inventor and any experts you believe are critical to making the venture work), financing suggestions, a timeline of events, and critical risks, followed by your references. Note that reports that use subheadings, bullet points, and embedded tables and graphs are much more interesting than those that don't. Also, research is the key to credibility, so all assertions throughout the paper should be supported by strong background research from law, business and science sources.

FINAL TEAM POWERPOINT/POSTER PRESENTATION

At the final class, you'll be asked to present your plan in a brief, 15-minute presentation. Each team member must participate in the presentation, but who presents what section for how long is up to your team. A good idea is to use the best speaker to open and close the presentation. It is imperative to practice, as you will be timed and when the allotted time is over, you'll have to finish your sentence and end the presentation. Make the presentation as interesting as possible. A good way to do this is typically to begin with the problem that your technology is trying to solve. Explain the need and then show how your product or service is the best available to solve that particular problem. There will be a brief q and a after each presentation. Because posters are often the preferred presentation format at many conferences, including BIO and other national meetings, we also ask that your team put together a poster with your project description and recommendations. In both of these exercises, be aware that you often will be presenting

to not only a scientific audience but also to a business audience, so your explanation must be user friendly and understandable to both types of viewers.

COURSE SCHEDULE

(Please note: all written assignments are for the team, not individuals; pizza will be served at the beginning of each class; please bring your own drink; vegetarian options will be available)

The course will consist of ten three-hour evening sessions beginning Thursday, Feb. 12, which will cover the following topics. The last class, which will consist of final presentations, is scheduled for Thursday evening, April

February 12 **Introduction to University Technology Commercialization**

Readings: York, "Critical Success Factors of University Technology Transfer," presented at the U.S. Association for Small Business and Entrepreneurship (USASBE) national meetings, January, 2007; Myers and Hurley, "Bioscience Education Programmes in the United States," *Journal of Commercial Biotechnology*, January, 2008; Friedman, Introduction and The Development of Biotechnology, *Building Biotechnology*.

Guest Speakers: Dr. Michael Dixon, Vice President of Operations, UNeMed Corporation; Lee Fenicle and Mary Ann Wendland, Directors, Creighton Office of Intellectual Resources Management

In-Class Activities: Introductions, syllabus review, team-building mixer, Confidentiality Agreement's and media permissions; introduction to class project by Joe Runge, UNeMed, Dr. Ben Boedeker, UMMC/VA, and Dr. Miller, KarlStorz. Begin researching the telemedicine field, including trends, recent developments, possible applications.

Due Today: In addition to the readings, *each class member* should locate and read one article about bioscience startups in the business press and bring a copy of the article to class. During team time, meet with your team to develop a strategy and time line for completing your course project, which will be a business plan for licensing or developing a start-up plan for your product. At the end of class, turn in this plan, which will include your meeting times, communication strategies and preferred division of labor.

February 19 **Key Concepts and Latest Developments in the Biosciences**

Readings: Friedman, Science (Introduction to Molecular Biology, Drug Development, Tools and Techniques, Applications), *Building Biotechnology*. Please note that your text has appendices

containing key terms, annotated bibliography, and internet resources available.

Guest Speakers: Dr. Prafulla Raval (microbiology), Dr. Karin van Dijk (biology), Dr. Bill Hamilton (pharmacy)

In Class Activity: Teams will choose their telemedicine projects; Chris Carmichael and Richard Jizba, from the Reinert Undergraduate Library Business Reference Department and the Health Sciences Library, respectively, will help teams develop techniques and resources for conducting background science and business research.

Due Today: Team overview of the trends in the telemedicine industry, including major areas of research, technological frontrunners, and key applications. In addition to the background readings due, *each class member* should bring locate, and read an article about a new scientific and/or technological development in the biosciences and bring to class a copy of the article. Good sources of such articles are the technology sections of business magazines, *Science*, *Scientific American* and so forth.

February 26 **Intellectual Property Protection Strategies**

Readings: Friedman, Intellectual Property, *Building Biotechnology*.

Guest Speakers: Chuck Valauskas, founding partner, Valauskas and Pine, Chicago; Mary Ann Wendland, Associate Director, Creighton Office of Intellectual Resources Management.

In-Class Activity: Begin working on a patent, trademark, and internet domain search for your course project, based on the search techniques demonstrated and suggested by Mary Ann Wendland

Due Today: Provide a short (2-3 page) write up and table (with diagrams and photos as needed) of your team project's concept, along with industry trends related specifically to that project and your technological and market strengths and weaknesses relative to existing and/or potential competitors (graphs and tables would be useful).

March 5 **Regulation and the Research Process**

Readings: Friedman, Regulation, *Building Biotechnology*.

Guest Speakers: David Cloutier, Creighton Office of Sponsored Research.

In-Class Activity: Begin with your team researching what regulatory agencies, classifications and timelines may cover your project technology. Also look into any university or government requirements involving human subjects/clinical trials, etc. Begin outlining a timeline for commercializing your project.

Due Today: Provide a short (1-2 page) write up with your assessment of the IP position of your technology, including patents, trademarks, and copyrights. That is, identify your technology's IP strengths and weaknesses relative to existing or future competitors.

March 12 **Spring Break**

March 19 **Licensing vs. Startup**

Readings: Friedman, Marketing, Licensing, Alliances and Mergers, Managing Biotechnology, *Building Biotechnology*. Bender, "The Art and Science of Licensing in the Pharmaceutical and Biotech Industries," *The Licensing Journal*, January, 2007; sample licensing agreement (posted on BlueLine course home page)

Guest Speaker: David Conrad, VP, University of Nebraska Office of Research; Lee Fenicle, Director, Creighton Office of Intellectual Resource Management.

In-Class Activity: Begin writing a licensing agreement or startup plan outline for your class project.

Due Today: Bring to class a summary of the regulatory issues affecting the commercialization of your technology, along with a timeline for working through the regulatory process. Include any human or animal subjects or clinical trial requirements of the government and/or university.

March 26 **Funding the Venture I – the Role of Venture and Angel Capital**

Readings: Friedman, Biotechnology Company Fundamentals, Finance, Investing, *Building Biotechnology*.

Guest Speakers: Jeff Hanson, DeNargo Capital; Ted Schwab, health care technology consultant and former chief innovation officer, Alegen HealthCare.

In-Class Activity: Identify potential funders and/or licensees of your project technology.

Due Today: Rough draft of a licensing agreement or an annotated outline for a business startup plan for your class project and come to class with questions that arose during the creation of the draft, especially questions related to whether the product is best suited for licensing or startup.

April 2 **Funding the Venture II – Grant Possibilities/Other Options**

Readings: Visit the SBIR, NSF, Department of Defense, Department of Homeland Security, Department of Health and Human Services, and NIH websites. Search the web for other grant or funding possibilities that may apply to your technology. Be sure to look at trade associations who often sponsor such research grants. Identify grant possibilities, requirements and deadlines that may apply to your project technology.

Guest Speakers: Jean Waters, Nebraska Business Development Center; Clague Hodgson, Nature Technologies, Inc.

In-Class Activity: Begin drafting an SBIR or STTR grant application for your project technology.

Due Today: Document your findings on the SBIR/STTR, NSF and NIH and other websites and bring them to class, along with application instructions for the one or two that you think would be the best possible options.

April 9* **Easter Break**

April 16 **Adding Value Through Prototyping, Proof of Concept Data**

Readings: Friedman, Research and Development, *Building Biotechnology*.

Guest Speakers: Dr. Chuck Filipi, SafeStitch.

In-Class Activity: Work on a plan for prototyping and/or providing proof of concept and outline what data would need to be collected in order to proceed to obtaining outside funding for and/or licensing of the project

Due Today: Develop a list of questions about the process of adding value to the product

April 23 **Marketing and Pitching Technology Ventures**

Readings: Visit www.mootcorp.org and review at least one winning business plan competition (preferably bioscience-based) presentation; bring your notes to class on strengths and weaknesses you found.

In-Class Activity: Begin working on your PowerPoint presentation for your product

Due Today: Develop the section of your plan outlining the timeline and a spreadsheet showing the funding needed for your project to be commercialized, including any assumptions that you make to project these numbers.

April 30 **Public Policy/Economic Development/Career Development**

Readings: Friedman, International Biotechnology, Building Biotechnology, Career Development, Final Words, *Building Biotechnology*; Pisano, "Can Science Be a Business? Lessons from Biotech," *Harvard Business Review*, Oct. 2006.

Guest Speakers: Ken Moreano (Scott Technology Center); Tom Chapman (Omaha Chamber); Dr. Jim Linder (UNeMed)

In-Class Activity: Begin working to integrate your team's final report; practice team presentations to get feedback

Due Today: Develop a 15 minute draft PowerPoint presentation covering your licensing or startup plan

May 7* **Final Team Marketability Analysis Reports Due/Presentations**

The course deliverable will be a professionally bound marketability analysis of the bioscience technology that your group has been assigned. This will include both a report including all of the sections you have worked on during the course, along with a table of contents, list of references and appendices as appropriate. Your team's 15-20 minute PowerPoint presentation should include patent/trademark information, competitor analysis, market size and scope, likely durability of the idea, your recommendation for the best channel to commercialize the technology, whether the product is best licensed or produced as a start-up, estimated funding needed as well as possible funding sources, and an estimated activity and time line for commercializing the technology. An electronic version of the final report and PowerPoint presentation should be emailed to Dr. York when the final report is turned in.

* Please note that if the entire class votes to meet on Thursday evening, April 9 (Easter break officially begins at 5 that evening), we will move every class after that up one week

and thus end with final presentations on April 30. We'll take this vote during the first class and if needed, the schedule and syllabus will be adjusted accordingly.