Farley Center for Entrepreneurship and Innovation
Northwestern University
Fall Quarter 2014

COURSE
NUvention Nano (ENTR 490)

TEXT
Radical Abundance, K Eric Drexler, Public Affairs, 2013
(Both available on Amazon as an e-book)

TIME
Tuesday, 12:30-3:30PM

LOCATION
Ford Studio Classroom

PROFESSOR
Mike Marasco, Clinical Professor & Director, FCEI
mmarasco@northwestern.edu, Ford 1.221, 847-467-6347

FACULTY
Jon Servaites, Adjunct Faculty, Farley Center for Entrepreneurship and Innovation and Visiting Scholar, Weinberg College of Arts and Sciences,
jservaites@northwestern.edu

PROGRAM WEBSITE
https://entrepreneur.northwestern.edu/nuventionnano/

CONTENT WEBSITE
https://www.udacity.com/course/viewer#!c-ep245/l-48743167/m-48750057

OFFICE HOURS
I will try to be in the classroom by 12:15PM and will stay after class is completed. I am on campus every weekday. Please email me to schedule a time. Please contact other NUvention members directly to schedule an appointment.

PROGRAM OFFICES
Farley Center for Entrepreneurship and Innovation, Ford Engineering Design Center, 2133 Sheridan Road, #1.221-Ford 1st floor across from MMM in October)
Evanston, 847-467-6347

COURSE OVERVIEW
The Farley Center (FCEI) in partnership with the International Institute for Nanotechnology (IIN) have partnered to create NUvention Nano. The partnership model proposed here is similar to the NUvention Energy where the Farley Center partnered with ISEN-Institute for Sustainability and Energy at Northwestern., NUvention classes have been the most consistent source of start-ups flowing out of any Northwestern class.
NUvention Nano will differ from other NUvention classes in a number of areas:

- **Partnership with Researchers** – Interdisciplinary students teams will be created and assigned to an NU faculty member to work on commercializing a technology the faculty member believes has potential. This technology will have been already disclosed to INVO and the faculty member has expressed an interest in creating a start-up to commercialize. There is no expectation for student-developed intellectual property. Any decision to create a start-up rests with NU faculty member, INVO and class faculty.

- **Commercialization Innovation** – Focus of class is to determine a viable business model to commercialize faculty research. Student teams are not engaged in technology innovation, but their efforts may inform technology evolution. This singular focus has not been attempted in other NUvention classes.

- **Alumni/Industry Engagement** – Alumni mentoring and industry engagement is even more critical when working with early stage nanotechnology.

This class cannot make you into an entrepreneur. It can help you better assess whether an idea is a business opportunity and how to transform that opportunity into a business.

As you already know, the best way to learn something is to actually do it. Since we cannot find companies for all of you to run, we will do the next best thing. The class project will involve putting together a business model for your technology within a small interdisciplinary groups. This process should help students take advantage of whatever current or future business opportunities they may choose to pursue in their careers.

**COURSE GOALS**

Our overall goal is to help you understand how to evolve a technology into a business. Our course objectives include:

- Work with an interdisciplinary team to build a business model for an early stage nanotechnology
- Learn about the broad area of nanotechnology from company success and failures
- Learn and apply Lean Startup methodologies
- Learn how to assess whether and idea is a good business opportunity
- Understand how to create value in a business
- Learn to develop compelling idea pitches and business models

Over time, you will more than likely forget the some of the frameworks, cases and other things you learn here. My hope is you never forget how to spot a good idea and develop it into a business.

**STUDENT ROLE**

In return for the time you spend reading, researching, getting out of the building conducting Customer Development, it is my responsibility to see that you get the most out of your efforts. I hope to create a classroom environment that is interesting and fun. Your participation in class is CRITICAL to accomplishing our goal. You should come prepared to discuss the assigned case and reading.

**INSTRUCTOR ROLE**

My role as instructor is to facilitate the learning. You will do the majority of the talking. I will be taking notes on the board to help provide a path through the class discussion.
GRADING  
Your grade will be compiled from these different components:

- CLASS PARTICIPATION 10%
- PEER ASSESSMENT 10%
- ADVISOR ASSESSMENT 10%
- LAUNCHPAD CENTRAL CONTENT 40%
- FINAL PRESENTATION 30%

Class participation will be graded based on quality versus quantity. I place high importance on comments that move the class discussion forward. Class and team attendance will be factored into your participation score.

CLASS FORMAT  
60% of class time will be allotted to discussing the topic of the session, 40% will be allocated to either team feedback time and/or team workgroup time.

POST-CLASS START-UP  
A reminder about the language in the class application you agreed to:

_I understand that projects in NUvention Nano involve Northwestern University research and intellectual property. Completing the requirements of the class does not entitle student teams to continue working on the project once the class has completed. The decision to pursue a start-up company based on work in the class will be made by the NU faculty member(s) that invented the technology and the Innovation New Ventures Office (INVO)._

Rest assured that any potential start-up will be carefully considered by the faculty member and INVO and we hope that student teams may continue and will do all we can to encourage post-class efforts._
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| 1    | 9/23/14 | **Class Intro**  
*Mike Marasco*  
- Illinois and Mirkin Nano Overviews  
**Student Syllabus Input**  
**Team Formation** | Read Illinois and Mirkin Nano Overviews  
Prioritize Projects  
Purchase required texts  
Register to attend International Institute of Nanotechnology Symposium on 10/10/13 |
| 2    | 9/30/14 | **Lean Startup, Customer Development, Business Model Canvas & LaunchPad Central**  
*Mike Marasco*  
*eLucid Live Case Study*  
*Jon Servaites* | Read Blank Chapters 1-2  
Read Drexler Chapters 1-3  
View Blank Udacity Lessons 0-1.5B  
Submit team weekly status via LPC  
Submit Team Charter via Leadership Portal |
| 3    | 10/7/14 | **Customer Discovery, Value Proposition, and Hypothesis Testing**  
*Mike Marasco*  
**NanoInk Live Case Study** | Read Blank Chapters 3-4  
Read Drexler Chapters 4-6  
View Blank Udacity Lessons 2-3  
LPC-Complete initial BMC  
Submit team weekly status via LPC  
Have 10 customer interviews documented in LPC |
| 4    | 10/14/14| **Channels and Customer Relationships**  
**Debrief on Nanotech Symposium**  
*Jon Servaites* | Read Blank Chapters 5-6  
Read Drexler Chapters 7-9  
View Blank Udacity Lessons 4-5  
LPC-Update BMC  
Submit team weekly status via LPC  
Have 5 additional customer interviews documented in LPC |
| 5    | 10/21/14| **Revenue Models and Partners**  
**Nanosphere Live Case Study** | Read Blank Chapters 5-6  
Read Drexler Chapters 7-9  
View Blank Udacity Lessons 6-7  
LPC-Update BMC  
Submit team weekly status via LPC  
Have 5 additional customer interviews documented in LPC |
| 6    | 10/28/14| **Resources, Activates and Costs**  
**Aurosense Live Case Study** | Read Drexler Chapters 10-11  
View Blank Udacity Lesson 8  
LPC-Update BMC  
Submit team weekly status via LPC  
Have 5 additional customer interviews documented in LPC |
| 7    | 11/4/14 | **MIDPOINT REVIEW**  
*Advisory Board, Faculty, and Guests** | Midpoint Review Presentation  
LPC-Update BMC  
Submit team weekly status via LPC  
Have 5 additional customer interviews documented in LPC  
Complete Team Assessment Mid-Point Review |
<p>| 8    | 11/11/14| <strong>Customer Validation</strong> | Read Blank Chapters 7-8 |</p>
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| 11/18/14   | **Positioning, Pricing, etc.**  
Live Case Study                         | Read Drexler Chapters 12-14  
LPC-Update BMC  
Submit team weekly status via LPC  
Have 5 additional customer interviews documented in LPC |
| 11/25/14   | **Pivot or Perish?**  
Live Case Study                         | Read Blank Chapters 9-11  
Read Drexler Chapters 15-16  
LPC-Update BMC  
Submit team weekly status via LPC  
Have 5 additional customer interviews documented in LPC |
| 11/25/14   | **Funding & Financing (Angel, Venture Capital, and Public Markets)**  
*Panel Discussion facilitated by Mike Marasco* | Read Drexler Chapters 17-18  
LPC-Update BMC  
Submit team weekly status via LPC  
Have 5 additional customer interviews documented in LPC |
| 12/02/13   | **Presentation Dry Runs**  
Final Pitch Draft                       |      |
| 12/9/13    | **FINAL PRESENTATIONS**  
*Advisory Board, Faculty, Guests*       | Final Presentation  
LPC completely documenting team efforts  
Completed Team Assessment End of Quarter Review |