

UMSI 363 Winter 2016 Innovations and Entrepreneurship in the Information Industry with iOS Mobile Devices

Lecture: 1:00-- 4:00pm Fri Shapiro Mac Classroom, RM 2000	Office Hours*: Prof Gilby: Tues 4-6 Engagement Center (UMSI EC) 777 North U, Above Panera Thurs 12-4:00 Engagement Center Manav Gabhawala (W 11:30-12:30) EC manavg@umich.edu Shubham Rajora (M 12-1) EC shubhamr@umich.edu
Instructor: Nancy Benovich Gilby, Ehrenberg Dir of Entrepreneurship, Clinical Associate Professor nabgilby@umich.edu 650-539-8376 Office: 777 North University (above Panera), near State St.	Contact Hours: In addition to the office hours above, I am available for individual appointments with prior notice. I will also check Canvas Monday - Thursday evenings.

Course Email

I have established a class email UMSI363Winter2016@umich.edu . Messages sent to this address will go to the entire class. Please use this email sparingly, and instead use Canvas for clarifying questions on assignments, study groups etc. Do not send answers, code, personal information, etc.

Course Description

Inspiration for innovation occurs often when people are passionate about changing the world. But what are the first steps to take? How do you ensure your efforts produce meaningful change and not just another product, service or non-profit that returns mediocre value? How do you balance your knowledge and drive for change as a lead service or product designer?

This course immerses students in an agile team innovation process, in an experiential classroom environment. While learning to apply information innovation methodologies students will:

- 1) Critically evaluate the problem space in their area of passion;
- 2) Pursue customer development; learn basic iOS Swift programming and
- 3) Implement and test ideas for a new or existing for-profit or non-profit impact as a prototype using the tools or technologies of the students choice (web, high-fidelity prototype, process mapping, mobile-iOS)

Throughout the course, students will identify and work closely with actual target customers, and receive regular feedback from successful innovators. The expected work volume of this course is estimated to be equivalent to 8-10 hours per week outside of class for a 14-week time-period.

This course requires introductory programming, SI 106 (Programs, Information and People), optionally SI 206 (Agile Web Development), or an equivalent introductory programming course. We will be teaching mobile prototyping in Swift , you will complete a Swift prototype before the end of finals. However, you can choose what prototyping environment you would like to use for your demo in your final presentation.

YOU DO NOT NEED TO BE TECHNICAL BUT YOU WILL BE REQUIRED TO ROLL UP YOUR SLEEVES AND LEARN. We will help you!

Completion of the following Lynda courses in the first few weeks of class: We will do exercises in class paralleling the videos instead of using a textbook.

1. Optional for non-tech [Programming for Non-Programmers:iOS 8](#)
2. [Swift 2.0 Essential Training \(6hr\)](#)
3. [iOS App Development with Swift Essential Training \(5hr 48m\)](#)

And during the semester:

4. [Agile Project Management with Bob McGannon \(1h 17m\)](#)
5. [Agile at Work: Building Your Agile Team with Doug Rose \(1h 4m\)](#)

Terminology, for skill-oriented learning objectives:

- **Mastery:** could do a task requiring this skill at the same level of skill as people who are paid full-time to do this kind of work; could teach this skill to others; could knowledgeably answer questions about this in an on-line forum and get up voted by other participants.
- **Competency:** could do a task requiring this skill on his or her own without delegating it, though not with the fluency of someone who had mastery; could post a well-formed question in an on-line forum that elicited a serious answer from someone with mastery.

Literacy: could play a meaningful role in a project where someone else exercises this skill and would understand what the other person was doing; could search in an on-line forum for an answer to a question, and interpret the response.

- **Awareness:** knows that this domain of knowledge exists; could fearlessly start the task of learning more through self-study or additional coursework.

High Level Learning Objectives

This course is aimed at students with an introductory technical background who are interested in learning more about entrepreneurial pathways or innovating around a specific passion-based idea. The purpose of this course is to provide students with necessary skills and tools for pursuing their passion-led innovations. Students will achieve this by identifying their target user and market, hypothesizing and testing the problem space in their target market and building and deploying a prototype service, product or process.

After completing SI 363 students will have a working, native Swift iOS prototype that has been user tested with target users. They will also have the initial theoretical background and framework to seek sustainability funding and identify pathways to continue their efforts from the course if they would like to further pursue them.

At the end of this course, students will be able to:

Mastery:

- None

Competency:

- Apply the core principles of innovation methods from Lean Startup, Customer Development, Crossing the Chasm and Agile Development in one of the following sectors: a for-profit business, non-profit, or cultural institution.
- Identify and develop innovation skills in Design Thinking, defining and testing a target market along with SCRUM Development from which to form and grow teams in order to achieve innovation success.
- Create a prototype service, product or process using the technologies or tools of their choice.
- Adaptively apply specific methods of innovation ideation, business/product/service development, and identifying steps for preparation for for-profit or non-profit incorporation.
- Take a leadership role in an agile software development process as the Scrum Master or Product Owner.
- Critically examine innovation area investments, scholarship, and trends.
- Create a mobile app prototype (phone or watch) using iOS development tools and environment.

Literacy:

- User test their prototype app.
- Conduct and present findings of competitive analysis and market sizing
- Develop a basic sustainability model

Awareness:

- Identify pathways supported by the University of Michigan to continue developing their innovation.

Detailed Learning Objectives

At the end of this course, students will be able to:

Develop a prototype service, product or process using the tools of their choice and at a minimum, develop a simple prototype in native iOS using Swift:

- Use the following innovation concepts in homework and final project:
 - Hypothesize and validate problems in their area of passion using Customer Development tools and techniques from Steve Blank, Lean Startup Methodology from Eric Reis.
 - Develop a Customer Profile
 - Develop a Value map and fit
 - Use Lean principles throughout the class Vision/Steer/Accelerate
 - Identify the 9 areas of the Business Model Canvas for your app
 - Customer Segments
 - Value Propositions
 - Channels
 - Customer Relationships
 - Revenue Streams
 - Key Resources
 - Key Activities
 - Key Partnerships
 - Cost Structure
 - Apply Agile team development to a mobile software project following the 12 principles
 - Highest priority is to satisfy the customer
 - Welcome changing requirements
 - Deliver prototypes and working software frequently
 - Designers, Developers and Business people must all work together
 - Build projects around motivated individuals
 - Face to Face conversation is the most effective way to convey information within a development team
 - Working prototypes and software with feedback from the target user are the primary measure of progress
 - Agile process promote sustainable development
 - Continuous attention to good design and technical excellence enhances agility
 - Simplicity – the art of maximizing the amount of work not done – is essential
 - The best requirements, design and architecture emerge from the self-organizing teams
 - At regular intervals the team reflects on how to become more effective, then adjusts behavior
 - Develop and give an Ideation Pitch and Demo to entrepreneurs and potential investors covering:
 - Problem
 - Target User/Customer
 - Market Size
 - Competition Landscape
 - Your Unique Solution
 - DEMO

Format

The format for this class will be based on applying methods learned in class to real world opportunities in a team of 2-4 people. This 3-credit course consists of 3 hours of class time per week, 8-10 outside of class hours for assignments and reading. We will be using a partially “flipped” classroom. It is expected that you will read and perform all assigned exercises before class. To do this well, you will generally need to allocate about 3-4 hours (NOTE: 6-8 hours if 3 hr lecture) of exercise preparation and reading time before each lecture session.

During the official lecture time, we will review tricky points and difficult exercises, solve additional problems together, discuss the non-programming course topics and readings and preview of the next session’s material. You will need to allocate about 1-2 hours of reading time each week for the non-programming readings.

If you are doing the 8-10 hours of prep time weekly, you will often be able to complete the graded homework with this timeframe. If you don't do the prep before class, you will lose much of the benefit of the class time, and will end up spending more total time trying to catch up in order to do the homework. You will also lose the points for prep, so it will hurt your grade directly.

Materials

1. **Textbook:** [The Swift Programming Language](#) (Apple Inc). Free
2. **Textbook:** [Using Swift with Cocoa and Objective-C](#) (Apple Inc). Free
3. **A Macintosh Laptop.** You will need a laptop for this course, **and you must bring it to class** if you have a mac. Tablets are not sufficient as a programming environment. We will meet in a Mac lab.
4. **Software.** The software used for the course is 100% free.
 - a. XCode 6.0 + You must download and install on your laptop or use a lab mac.
 - b. <https://trello.com/> - Sign up for a free account
5. **iOS Mobile Device:** Access to an iPhone or iPad (support iOS 7+) to test and demonstrate your prototype
6. **Optional:** [Business Model Generation](#): by Alexander Osterwalder
7. **Optional:** [Value Proposition: How to Create Products and Services People Want](#): by Alexander Osterwalder
8. **Optional:** [The Lean Startup](#): by Eric Ries
9. **Optional:** [The Four Steps to the Epiphany](#): by Steve Blank
10. **Optional:** [The Entrepreneur's Guide to Customer Development](#): A cheat sheet to The Four Steps to the Epiphany by Brant Cooper, Patrick Vlaskovitz, Steve Blank
11. **Optional:** [Crossing the Chasm](#): Marketing and Selling High-Tech Products to Mainstream Customers
12. **Optional:** [The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies](#): By Erik Brynjolfsson and Andrew McAfee
13. **Optional:** [Inside the Tornado: Marketing Strategies from Silicon Valley's Cutting Edge](#):
14. **Optional:** [The Tipping Point: How Little Things Can Make a Big Difference](#): by Malcolm Gladwell
15. **Optional:** [Ice Cream Social: The Struggle for the Soul of Ben and Jerry's](#): by Brad Edmonson
16. **Optional:** [High Stakes, No Prisoners: A Winner's Tale of Greed and Glory in the Internet Wars](#): by Charles H. Ferguson
17. **Optional:** [Good To Great](#) and [Built to Last](#): by James C. Collins, Jerry I. Porras
18. **Optional:** [Peopleware](#): by Tom DeMarco and Tim Lister

Using the Course Mailing List and Canvas

Much of the communication for the course will be handled through email and Canvas. Students are expected to keep up with all email that comes to them from the course mailing list and check Canvas on a regular (3x week minimum) basis. Canvas is the preferred place to get help in the class and you must check Canvas before emailing a question to the lab assistants or me. It is completely acceptable and encouraged for a student in the course to attempt to help other students in the forums. The instructional staff will read all posts and correct any incorrect advice that one student gives another. All students have permission to post to the mailing list and Canvas.

Accommodations

If you think you need an accommodation for a disability, please let me know at your earliest convenience, but as soon as possible. Some aspects of this course, the assignments, the in---class activities, and the way I teach may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate accommodations. SSD (734---763---3000; <http://www.umich.edu/~sswd/>) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information you provide as private and confidential.

Giving and Receiving Assistance

Learning technical material can be challenging. We move quickly through a wide range of topics. Our goal is for you to succeed in the course, and we encourage you to get help from anyone you like and online repositories. You may get help even in completion of assignments. However, you are responsible for learning the material, and you should make sure that all of the assistance you are getting is focused on gaining knowledge, not just on getting through the assignments. If you receive assistance on an assignment, please indicate the nature and the amount of assistance you received. If the assignment is computer code, add a comment crediting sources (as in any academic paper) or indicating who helped you and how. If you are a more advanced student and are willing to help other students, please feel free to do so. Just remember that your goal is to help teach the material to the student receiving the help. It is always appropriate to ask for and provide help on assignments via Canvas or during the open lab portions of class

Plagiarism

At the University of Michigan and in professional settings generally, plagiarism is an extremely serious matter. All individual written submissions must be your own, original work, written entirely in your own words. You may incorporate excerpts from publications by other authors, but they must be clearly marked as quotations and properly attributed. You may obtain assistance with copyediting, and you may discuss your ideas with others, but all substantive writing and ideas must be your own unless explicitly attributed to another, using a citation sufficiently detailed for someone else to easily locate your source.

All cases of plagiarism will be officially reported and dealt with according to SI policies. There will be no warnings, no second chances, no opportunity to rewrite; all plagiarism cases will be immediately reported to SI's Dean of Academic Affairs. Consequences can range from failing the assignment (a grade of zero) or failing the course to expulsion from the University. For additional information about plagiarism, see the "Academic and Professional Integrity Policy Statement" in the UMSI Student Handbook, the Rackham pamphlet on Academic Integrity, and the plagiarism document from the UM Libraries. If you have any doubts about whether you are using the words or ideas of others appropriately, please discuss them with the instructional staff of the course.

Work in the Course – Getting a Grade

Scoring Breakdown

Lynda courses completion	10%
Midterm with SWIFT/Cocoa Exam (open book, web)	10%
Assignments	40%
Final Group Project	30%
Participation, Quizzes, Instructors Subjective Opinion	10%

Weekly Average Workload

Class	3 hours
Reading	2 hours
Assignments	6-8 hours
TOTAL	11-13 hours

Lynda

Lynda courses are required to be completed before the midterm exam. You must submit a link to your progress page so you can receive credit.

Assignments

There will be assignments throughout the course (pretty much every week and sometimes mini exercises during a lecture). Regular assignments allow you to learn the material in small "chunks" and to keep a close eye on how well you understand the material. In some cases, we will do part or all of the graded assignments during a lecture.

There will be regular assignments during the course of the semester. If an assignment is up to 24 hours late, it will be given a 20% penalty. Beyond one day late, no points will be given. If Canvas is completely down at 10pm when an assignment is due, I will extend the deadline until 10am the next morning.

In almost every class period there will be a small question(s) or quizzes at some point in the lecture. These assignments are pass/fail/negative and no late credit is given. If you answer the question correctly you receive 1 pts, if you answer incorrectly you receive 0 pts, if you don't answer at all, you receive -1pt.

Exam

There will be one exam in this course, the SWIFT exam prior to the drop date. The exam is closed book/closed note and based on the class readings, homework, and discussions. Study guides will be available.

Final Group Projects

Your final project will be done as a group using an Agile development method. The final project is cumulative throughout the course of the semester and requires periodic updates and a final presentation during the last week of class. Part of this work will be done in class and it must be presented in class. Periodically, you will demonstrate your progress on the value proposition, functionality, usability and quality of mobile app. The final projects will be the only "ranked" assignment, where the presentations are judged comparatively to other projects.

Grading

Getting an A+

You may earn an A+ by exceeding requirements throughout the semester. To earn this, you must have received at least **95%** on the exam and have a 98% overall. You must contribute **weekly** to the Canvas message boards. In addition your project must be ranked in the top 3 of the class.

A	94% and above	B-	80% and above
A-	90% and above	C+	77% and above
B+	87% and above	C	70% and above
B	84% and above	D	60% and above

*****TENTATIVE***Course Outline (subject to change with prior notice)**

The schedule is subject to change, but any changes will be posted immediately.

WEEK		Read Before Class	In Class TOPIC
1	Jan 11		Module 1 Discussion: Intro to Innovation Lab: Xcode, Swift, Trello,
2	Jan 18	No Class MLK Day	
3	Jan 25	<ul style="list-style-type: none"> • Business Model Generation Chpt 1-2 • Value Proposition: Chpt 1 • Swift 2.0 Essential Training (6hr) <ul style="list-style-type: none"> ○ WATCH: What you should know before watching this course ○ WATCH: Creating optional bindings ○ WATCH: Working with closure ○ WATCH: Using closures to calculate values ○ skim the remaining content, try some random exercises • iOS App Development with Swift Essential Training (5hr 48m) <ul style="list-style-type: none"> ○ WATCH all videos Introduction, 1 Getting Started, 2 Core Skills, 3 Basic iOS UI 	Module 2 D: Lean Startup, Business Model Canvas, Submit ideas L: iOS app lifecycle, MVC, controls, events, Table Views, To Do List part 1
	Feb 1	<ul style="list-style-type: none"> • The Lean Startup: Chpts 1-4 • Intellectual Property Overview • Alice Rulings, Software and Business Methods Patents • Raising Venture Capital, recent example • Business Model Generation (all short videos) <ul style="list-style-type: none"> ○ Episode 1 - Getting From Business Idea to Business Model ○ Episode 2 Visualizing Your Business Model ○ Episode 3 - Prototyping (testing) ○ Episode 4 - Navigating Your Environment (just a note some of the terms might seem intimidating/very business-y but give it a go) ○ Episode 5 - Proving it (customer development and lean startup) ○ Episode 6 - Telling your story • iOS App Development with Swift Essential Training (5hr 48m) <ul style="list-style-type: none"> ○ WATCH all videos 4 iOS App Architecture, 5 Using Table Views 6 Multiple View applications (all will help with To Do List App Homework!) • Ideas Vote 	Module 3 D: Review Swift Questions, Unique Value Proposition, Secret Sauce, IP L: Debugging, To Do List pt 2 Guest Lecture: Patent Officer Guest Lecture: Roger Ehrenberg: How to Raise a Series A round in Plain English IDEA PRESENTATIONS: VOTE

5	Feb 8	<ul style="list-style-type: none"> • iOS App Development with Swift Essential Training (5hr 48m) <ul style="list-style-type: none"> ◦ WATCH all videos 7 Using Storyboards 8 Ipad Development (all will help with To Do List App Homework!) • Replacing User stories with job stories • Typical venture funding pitches: The Sequoia 10 • Agile Project Management with Bob McGannon (1 h 17 m) • START CUSTOMER VALIDATION ROUND 1 	Module 4 D: Target user and most urgent problems hypothesis, Communication Covenant L: Using TableViews, create Simple Multiplication Table
6	Feb 15	<ul style="list-style-type: none"> • CUSTOMER VALIDATION ROUND 2 	Module 5 D: Shareout Round 1, Team, Target user and most urgent problems hypothesis L: Grabbing content from the web: What's the Weather app
7	Feb 22	Design Thinking Workshop with MakeHealth	
8	Feb 29	SPRING BREAK	
9	Feb 29	<ul style="list-style-type: none"> • KJ Methodology (vs Affinity Diagrams) • CUSTOMER VALIDATION ROUND 3 • Complete iOS App Development with Swift Essential Training (5hr 48m) • 9&10 submit CERTIFICATE 	Module 6 D: Shareout Round 2, Customer Development, Team Guest Lecture: Agile Development Case Study L: Review for Midterm
1	Mar 07	Individual Midterm Exam <ul style="list-style-type: none"> • KJ Method of Contextual Inquiry (add notes from Prof Joe Lassiter HBS) pg 153-156 • KJ Methodology (vs Affinity Diagrams) • Constructing a KJ Diagram – The Wharton School full paper SOLUTION VALIDATION ROUND 4, KJ	Module 7 Individual Midterm Exam D: KJ Method, Shareout Round 3, Chasm, Tipping Point, Team L: Develop KJ
1	Mar 14	<ul style="list-style-type: none"> • Coffee Break EP33: Design Thinking with Tim Brown • First pass wireframe design (Customer Interview Break ☺)	Module 8 D: Overview of Full Stack Development with Parse. Shareout KJ: L: Design Thinking exercise on your idea Backend as a service, Hello world using Parse, Wireframe

1 2	Mar 21	<ul style="list-style-type: none"> • Crossing the Chasm: Chpt 1 & 2 • Inside the Tornado: Chpt 1-2 • Business Model Generation Chpt 3 <p>SOLUTION VALIDATION ROUND 5, Wireframes, Front End Screen Designs</p>	<p>D: Product adoption strategy using “Crossing the Chasm”</p> <p>Examples in Parse</p> <p>L: Parse 2. Creating tables in parse, Storing information, Retrieving information, putting it on the screen, signup, Log in, log out</p> <p>L: Backend as a service, Parse, Business Model Canvas, Front End Screens in Swift, Score MVP Design</p>
1 3	Mar 28	<ul style="list-style-type: none"> • Crossing the Chasm: Chpts 3-7 • The Lean Startup: Chpt 5-8 	<p>D: Chasm & Lean, sustainability model</p> <p>Shareout front end design, score</p> <p>L: Front and backend data model for MVP, functionality not working (start from Parse examples, strip, revise?), simple sustainability model</p>
1 4	Apr 4	<ul style="list-style-type: none"> • The Entrepreneur's Guide to Customer Development: Chpt 1-5, 8 <p>SOLUTION VALIDATION ROUND 6, Share draft pitch and rough demo</p>	<p>D: Storytelling, example of good (and not so good) pitches</p> <p>L: Work on MVP, Draft Pitch</p>
15	Apr 11	<ul style="list-style-type: none"> <input type="checkbox"/> High Stakes, No Prisoners: A Winner's Tale of Greed and Glory in the Internet Wars pgs 69---83 <input type="checkbox"/> Ice Cream Social: The Struggle for the Soul of Ben and Jerry's Chpts 3, Epilogue <input type="checkbox"/> Review/Revise presentation/demo 	<p>D: Share out pitch and demo, final feedback from users</p> <p>L: Revise MVP and Draft Pitch</p>
1 6	Apr 18		FINAL PRESENTATIONS
1 7	Apr 27		MVP SWIFT DUE