



Technology Entrepreneurship | Hacking for Defense H4D
EBGN 566
Spring Semester 2019

Instructor

Sid Hanna Saleh, PhD
Office: 310 Engineering Hall
Office Phone: 303-273-3550
Email: shsaleh@mines.edu

Office Hours

Fridays
12:00-1:00
AND flexible by appointment

Class Meetings

Tuesdays & Thursdays
5:30 – 6:45p

Teaching Assistant

Drake Harrison
wharrison@mymail.mines.edu

Course Overview

This course introduces concepts related to starting a technology-based venture. Presents concepts such as beneficiary discovery, prototyping, developing a business model, role of intellectual property, and the importance of learning through experimentation and iteration. Students gain hands-on experience in understanding and working with the Defense (DOD) and Intelligence Community (IC) on actual current problems.

LEARNING OBJECTIVES

The primary goal of the course is that upon completion you are able to think, act and deliver results like an entrepreneur. If entrepreneurship is not for you, that's perfectly fine. In large organizations, entrepreneurial attitudes and thought processes are highly valued – it's called intrapreneurship. The learning from this course is applicable to organizations small and large, government, and non-profits in any field across the world. At the conclusion of this course, you will be able to:

- Translate DoD/IC problems into opportunities for innovation
- Conduct effective beneficiary discovery in efficient ways
- Build lasting relationships with stakeholders
- Develop creative approaches to real and perceived constraints
- Choose appropriate skills and tools to quickly test assumptions
- Think, act and deliver results like an entrepreneur
- Create value by solving challenging and consequential problems

REQUIRED COURSE RESOURCES

- Savoia, A. (2011). Pretotype it. Download at <http://bit.ly/2btqaci>
- Ingenuity, common sense and a cheerful attitude

Recommended Course Resources

- *Business Model Generation* (Wiley), Osterwalder and Pigneur (2010)
- *The Monk and the Riddle* (HBS Press), Komisar with Lineback (2000)
- *Startup Owner's Manual* (K & S Ranch): Blank & Dorf (2012)

Course Structure: A Startup Accelerator

This is a practical class – essentially a lab, not a theory or “book” class. Within the constraints of a course, our goal is to *help you engage stakeholders in the Department of Defense and Intelligence Community* by:

1. Profoundly understanding the problems/needs of government customers,
2. Rapidly iterating technology solutions while searching for solution-problem fit,
3. Understand stakeholders’ constraints, deployment issues, costs, resources, and ultimate mission value,
4. Experiencing how to develop creative solutions regardless of constraints.

Rather than engaging in months of business planning, we assume that all you have is a series of untested hypotheses—basically, good guesses about what the solution is, who the customer is, other stakeholders, impact of potential regulation, deployment, funding, etc. And that regardless of how elegant your plan, the reality is that most of it starts out wrong. You need to *get out of the building and get off campus* to search for the facts that validate or invalidate your hypotheses, and ultimately enable you to pursue strategies that will accelerate the identification and development of a solution for your sponsor that helps the organization achieve its mission.

Our class formalizes this *search for a repeatable, scalable mission model*. We do it with a process of hypothesis testing familiar to everyone who has been in a science lab. In this class you’ll learn how to use a *mission model* canvas to frame your hypotheses.

Second, you’ll “*get out of the building*” using an approach called *Beneficiary Development* to test your hypotheses. You’ll run experiments with DOD/IC end users and stakeholders and collect evidence about whether each of your hypotheses is true or false. (Simultaneously you’ll be using *agile development* to rapidly build prototypes – pre prototypes – to accompany those experiments to elicit customer feedback.) That means that every week you’ll be talking to DOD/IC customers and stakeholders outside the classroom, testing your assumptions about different customers, product features, mission value, deployment, requirements and the government acquisition process. You’ll talk with at least 100 of them during the class.

Then, you’ll use those beneficiaries’ input to revise your assumptions and hypotheses, you’ll start the cycle over again, testing redesigned offerings and making further small adjustments (iterations) or more substantive changes (pivots) to ideas that aren’t working. The goal is to build/design something DOD/IC customers would actually want to use and deploy.

This process of making substantive changes to one or more of your mission model hypotheses – called pivots – before your DOD/IC customers would start an acquisition program for tens or hundreds of millions of dollars, helps you avoid huge future costs and potentially unforeseen dead-ends far down the road of development. (A pivot might mean changing your position in the value chain. For example; your team may realize that you can buy an off-the-shelf product and modify it to solve an immediate customer need. Or you can become an OEM supplier to a government contractor providing a critical part of a larger system, rather than selling directly to the government). Other pivots may move your company from a platform technology to becoming a product supplier, or from a systems supplier to a service provider.

Some teams may make even more radical changes. For example, your team may discover that there are more customers in the DOD than your original DOD/IC sponsor. Or you might discover that the product you’re developing is dual-use (it can be used for DOD/IC applications as well as the broader civilian market.)

We’re not interested in untested or abstract ideas or plans. Ideas are a dime a dozen. Ultimately, success in this course means you develop a solution to a problem and **the stakeholder(s)** (who suffer as a result of the problem) **find your solution promising/useful enough to have a vested interest in realizing it.**

COURSE ASSESSEMENT

Individual Grades

1. In-Class Participation (150 points)

Quality class participation is grounded in your preparation for and contribution to your team's progress. In addition, you are required to listen to presentations delivered by other teams and provide them with constructive feedback.

Here's a rough breakdown of how I assess in-class participation:

85-95%: You attend class consistently on time and actively participate in discussions. Your feedback and comments indicate genuine interest in collaborating and helping. Focus is on quality contributions, not quantity. Your teammates cannot live without you. Your course teams value your feedback.

75-84%: You attend class consistently on time and actively participate in discussions. Your comments indicate some interest in helping. Your teammates/classmates find you somewhat helpful.

70-74%: You attend class consistently on time, and usually do not participate in discussions. Your teammates/classmates wouldn't miss you if you were absent.

<69%: You don't come to class consistently and when you do, you are not usually engaged. Your teammates/classmates are wondering where you are.

2. Team Journal – Individual Contribution (150 points)

Your progress depends on seeking input from stakeholders and beneficiaries. This involves getting out of the building and talking to them. Out-of-the-building progress as measured by your individual contributions to your team's journal. You ought to connect with professionals who can be helpful to your team's progress and career. Summarize the learning outcomes of each meeting in your journal.

Team Grade

1. Team Journal – Team Progress (400 points)

To demonstrate meaningful progress each week, team members must complete required number of interviews, prototype, iterate and update deliverables including Empathy Maps and Mission Model Canvas. To maximize your opportunity to achieve progress, your team must invest in building and growing an excellent working relationship with stakeholders and beneficiaries.

2. Weekly Team Presentations (200):

Your team will report on your progress by presenting a brief presentation to your class every week. In addition to your classmates, stakeholders and mentors are the audience for your weekly progress updates.

3. Final Team Presentation (100 points):

This is your **final exam**. Details follow below.

Coursework Feedback & Return Policy: You can expect to receive real-time feedback on your work in class.

Absence Policy: Due to the experiential nature of this course, attendance in ALL class sessions is expected.

Summary of Assignments and Points

Assignment	Grading Basis	Points
In-Class Participation	Individual	150
Team Journal – Individual Contribution	Individual	150
Team Journal – Team Progress	Individual	400
Weekly Team Presentation	Team	200
Final Team Presentation	Team	100
Total		1000

SYLLABUS IS SUBJECT TO CHANGE DURING THE SEMESTER AS COURSE IS ADJUSTED TO FIT NEEDS

Journal Guidelines

Your journal is both a venue in which to keep track of your work and an opportunity to demonstrate the steps you took to evaluate and execute the idea. Thus, the journal should “show your work.” Include **a lot** of details. For example, rather than saying, “We interviewed eight people this week,” write down who they were, how you identified them, how/where you spoke, and for how long. Also include notes from each interview and an analysis of what you learned and how it influenced your choice of next steps. Generally speaking, “good” journals have frequent, detailed entries. “Average” journals appear to be a rush job put together in the last couple weeks of the semester.

COURSE EXPECTATIONS

Active Participation – All success is built on a foundation of hard work and curiosity. Do not procrastinate. The nature of group work is cumulative and poor work early on will make the deliverables much more difficult later on.

Collaboration – Entrepreneurship requires your active collaboration with others including co-founders, beneficiaries, employees, investors, partners, suppliers, etc.

Creativity – Entrepreneurship requires creative thinking. You have to be curious to explore new ideas regardless of their source and be willing to see multiple perspectives. To succeed, you must remain open to challenging your assumptions and beliefs.

Grievances: As a rule, makeup is not an option in this course. If you feel you have been graded unfairly on an assignment, you may follow this process:

1. Within **seven days** of receiving the grade, write me an appeal. After seven days, **grades are final**.
2. In your appeal, you must provide a **written statement** as to why the grade is unfair. Be sure to state your argument as to why the grade is not in alignment with grading standards, or the work was misinterpreted. Arguing that you need or deserve a higher grade because you worked hard is insufficient.
3. Submit your appeal to me **via email** and I will consider it and let you know my decision within seven days.

Diversity and Inclusion:

At Colorado School of Mines, we understand that a diverse and inclusive learning environment inspires creativity and innovation, which are essential to the engineering process. We also know that in order to address current and emerging national and global challenges, it is important to learn with and from people who have different backgrounds, thoughts, and experiences. Our students represent every state in the nation and more than 90 countries around the world, and we continue to make progress in the areas of diversity and inclusion by providing [Diversity and Inclusion programs and services](#) to support these efforts.

Students with Disabilities:

The Colorado School of Mines is committed to ensuring the full participation of all students in its programs, including students with disabilities. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me. Students with disabilities may also wish to contact Disability Support Services (DSS) to discuss options to removing barriers in this course, including how to register and request official accommodations. Please visit their website at disabilities.mines.edu for contact and additional information. If you have already been approved for accommodations through DSS, please meet with me at your earliest convenience so we can discuss your needs in this course.

Accessibility within Canvas:

Read the [Accessibility Statement](#) from Canvas to see how the learning management system at the Colorado School of Mines is committed to providing a system that is usable by everyone. The Canvas platform was built using the most modern HTML and CSS technologies, and is committed to W3C's Web Accessibility Initiative and [Section 508](#) guidelines.

Discrimination, Harassment, and Title IX:

All learning opportunities at Mines, including this course, require a safe environment for everyone to be productive and able to share and learn without fear of discrimination or harassment. Mines' core values of respect, diversity, compassion, and collaboration will be honored in this course, and the standards in this class are the same as those expected in any professional work environment. (More information can be [found here](#).) **Discrimination or harassment of any type will not be tolerated.** As a participant in this course, we expect you to respect your instructor and your classmates. As your instructor, it is my responsibility to foster a learning environment that supports diversity of thoughts, perspectives and experiences, and honors your identities. To help accomplish this:

- Course rosters are provided to the instructor with the student's legal name. I will honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.
- If something is said or done in this course (by anyone, including myself) that made you or others feel uncomfortable, or if your performance in the course is being impacted by your experiences outside of the course, please report it to:
 - Me (if you are comfortable doing so)
 - Wellness Center- [Counseling](https://www.mines.edu/counseling-center/) (<https://www.mines.edu/counseling-center/>)
 - [Speak Up](https://www.mines.edu/speak-up/) (<https://www.mines.edu/speak-up/>) – Anonymous Option

In this course, we will cultivate a community that supports survivors, prevents interpersonal violence, and promotes a harassment free environment. Title IX and Colorado State law protects individuals from discrimination based on sex and gender in educational programs and activities. Mines takes this obligation seriously and is committed to providing a campus community free from gender and sex-based discrimination. Discrimination, including sexual harassment, sexual violence, stalking, and domestic violence, is prohibited and will not be tolerated within the Mines campus community. If these issues have affected you or someone you know, you can access the appropriate resources on the [Mines Title IX website](#). You can also contact the Mines Title IX Coordinator, Camille Torres, at 303.384.2124 or titleix@mines.edu for more information.

It's on us, all of the Mines community, to engineer a culture of respect.

CARE @ Mines:

If you feel overwhelmed, anxious, depressed, distressed, mentally or physically unhealthy, or concerned about your wellbeing overall, there are resources both on- and off-campus available to you. If you need assistance, please ask for help from a trusted faculty or staff member, fellow student, or any of the resources below. As a community of care, we can help one another get through difficult times. If you need help, reach out. If you are concerned for another student, offer assistance and/or ask for help on their behalf. Students seeking resources for themselves or others should visit care.mines.edu.

Additional suggestions for referrals for support, depending on comfort level and needs include:

- [CARE at Mines](https://care.mines.edu) (care.mines.edu)– for various resources and options, or to submit an online “CARE report” about someone you’re concerned about (email care@mines.edu)
- [CASA](https://www.mines.edu/casa) (<https://www.mines.edu/casa>) – for academic advising, tutoring, academic support, and academic workshops
- [Counseling Center](https://www.mines.edu/counseling-center/) (<https://www.mines.edu/counseling-center/>)– for students to call 303-273-3377 for an appointment. There are also online resources for students on the website. Located in the Wellness Center 2nd floor at 1770 Elm St.
- [Health Center](https://www.mines.edu/student-health/) (<https://www.mines.edu/student-health/>) – students may call 303-273-3381 for appointment. Located in Wellness Center 1st floor at 1770 Elm St.
- [Colorado Crisis Services](http://coloradocrisiservices.org) (<http://coloradocrisiservices.org>) – for crisis support 24/7, either by phone, text, or in person. Colorado Crisis Services is a great confidential resource, available to anyone by calling 1-844-493-8255, or texting “TALK” to 38255. Walk-in location addresses are posted on the website.

All of these options are available for free for students. The Counseling Center, Health Center, and Colorado Crisis Services are confidential resources. The Counseling Center will also make referrals to off-campus counselors, if preferred.

In an emergency, you should call 911, and they will dispatch a Mines or Golden PD officer to assist.

Absence Policy:

The [Student Absences](#) webpage outlines CSM's policy regarding student absences. It contains information and documents to obtain excused absences.

Note: All absences that are not documented as excused absences are considered unexcused absences. Faculty members may deny a student the opportunity to make up some or all of the work missed due to unexcused absence(s). However, the faculty members do have the discretion to grant a student permission to make up any missed academic work for an unexcused absence. The faculty member may consider the student's class performance, as well as their attendance, in the decision.

In the case of an absence, the student is responsible for determining what work was missed and for putting forth a good faith effort to review the material on their own.

Policy on Academic Integrity/Misconduct:

The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining and fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

The complete policy can be found in the [Mines' Policy Library](#).

EBGN 566 H4D Course Schedule

W	S	Date	Topics/Activities	Presentation
1	1	Tue 1/8	Team Interviews	
		Thu 1/10	No class	
2	2	Tue 1/15	Overview: Goals & Expectations. Team Agreement	
	3	Thu 1/17	DoD 101	Problem Statement 1.0
3	4	Tue 1/22	Beneficiaries Discovery	Empathy Map 1.0
	5	Thu 1/24		
4	6	Tue 1/29	Value/Positioning Statement. Pretotyping	Positioning Statement 1.0 Pretotype 1.0
	7	Thu 1/31		
5	8	Tue 2/5	Pretotyping	Pretotype 2.0
	9	Thu 2/7		
6		Tue 2/12	No class: Career Day	Product-Mission Fit
	10	Thu 2/14	Pretotyping	
7		Tue 2/19	No class: Presidents' Day	Business Model 1.0
	11	Thu 2/21	Mission/Business Model	
8	12	Tue 2/26	Dual Use	Dual Use
	13	Thu 2/28		
9	14	Tue 3/5	Mission Achievement Metrics	Measure What Matters
	15	Thu 3/7		
10	16	Tue 3/12	Buy-in & Support	Buy-in & Support
	17	Thu 3/14		
11	18	Tue 3/19	Deployment	Deployment
	19	Thu 3/21		
		Tue 3/26	No class: Spring Break	Have Fun
		Thu 3/28		
12	20	Tue 4/2	Activities, Resources & Partnerships	Mission Model Canvas 2.0 Partnership Model 1.0
	21	Thu 4/4		
13	22	Tue 4/9	Mission Budget & Operating Plan	Mission Budget & Plan
	23	Thu 4/11		
14	24	Tue 4/16	Reflections & Road Map	Lessons Learned & Road Map
	25	Thu 4/18		
15	26	Tue 4/23	Presentation Prep, Tips & Best Practices	Rehearsals
	27	Thu 4/25		
16	28	Tue 4/30	Final Team Presentations	Celeberation
	29	Thu 5/2		

Schedule is very likely to change