Course Syllabus

Course Title: *Innovation and Entrepreneurship for Defense (IE4D)*
Course ID: ENGR 3195/5300
Fall 2023
Meeting Time: Tues 1:30 – 4:00
Location: McHugh 307

Contact Information

Primary Instructor(s):	Lisa McAdam Donegan (she/her pronouns) Alexander Grey (he/him pronouns)
Email	Lisa.mcadamdonegan@uconn.edu Alexander.grey@uconn.edu
Office Hours	Donegan: Tue 10:00 – 12:00 IPB 321 Thr 10:00 – 12:00 IPB 321 Grey: Mon 12:00 – 1:00 CAST 209 Wed 3:00 – 4:30 CAST 209 And by appointment

Students are encouraged to use office hours to meet with instructors and teaching assistants to discuss course material, questions, or concerns, as well as other related issues.

Course Description

Innovation and Entrepreneurship for Defense (IE4D) is an interdisciplinary and entrepreneurial course that provides students the opportunity to work with the Department of Defense (DoD) and Intelligence Community (IC) to better address the nation's emerging threats and security challenges. The course is part of the wider Hacking 4 Defense (H4D) ecosystem, a nationally recognized program run at over 30 universities across the United States. The module is an applied one that sees students form groups of teams that engage directly with complex, real-world problems proposed by US government sponsors. IE4D covers policy, economics, technology, national security, and any area needed to address the problem sponsor's challenge.

In this course, students work with a team and a problem, and then are provided with a range of relevant methodological tools and techniques, the problem space, and explore potential solutions. As the course progresses, student teams will be required to discover and validate customer needs and to continually test whether they understand the problem. Teams will take a hands-on approach that will require close engagement with

military, Department of Defense, and other government agency end-users, to validate these real-world challenges.

The goal, within the constraints of an academic setting, is to give students a framework to test solution hypotheses using a start-up model while creating all the pressures and demands of the real world in an early-stage start-up.

It is important to bear in mind that this module aims to simulate what start-ups and entrepreneurship are like in the real world: the need to take conceptually-sound decisions amidst uncertainty, challenging deadlines, and often conflicting input.

Course Objectives

Educational Objectives

- Equip students with a knowledge and understanding of some of the most pressing defense and security challenges facing the US government.
- Provide students with insights into some of the constraints and opportunities facing the government as it seeks to address these challenges.
- Equip students with a range of methodological tools focused on Lean Start-up principles that can be applied to real-world problems.
- Help students develop a repeatable model for problem-solving that can be used in a range of other contexts.

Student Learning Objectives

At the end of the course students will:

- Demonstrate knowledge and understanding of lean start-up methodology.
- Apply lean start-up principles to real-world defense problems and develop and test hypotheses.
- Develop the ability to engage with experienced problem owners.
- Enhance interpersonal and interview skills, through weekly interviews.
- Gather, organize, evaluate, and interpret information from a variety of sources.
- Make use of constructive feedback to achieve progression in understanding, methods, and judgment.
- Develop and apply key professional/transferable skills including teamwork; presentation skills; leadership, project management, complex problem-solving; building professional networks; market research.

Course Expectations

How the Course Works

Teaching Methods

This course will use a flipped classroom model designed to maximize student engagement during class time. Therefore, students are expected to “hit the ground

running" by reviewing the problem statements and completing the suggested preliminary reading and required aspects of the course.

What is Required of Students?

1. Preparation for weekly class lectures and reading/viewing
2. A minimum of 100 touchpoints per team with problem stakeholders
3. Weekly Team presentations
4. Course assessments as detailed below

Course Structure

Most class sessions follow the same format:

The first portion of each class session is devoted to student presentations that reflect the information presented in the previous week's lecture and provide updates on the progress the teams are making in their projects.

During the second portion of each class, students will be introduced to a new topic from the Hacking for Defense curriculum via experiential learning.

The calendar of course content is as follows:

Class Date	Topic	Student Presentations
8/27	Course introduction, H4 terminology, interviewing best practices; problem and sponsor introduction	No presentations; homework: build mock interview script; review problems and identify preferences
9/3	DoD and DoS crash course; teams assigned; initial team meets and concept formation	Again, no formal presentations; homework: meet as a team, begin concept formation, schedule a time to meet with problem sponsor
9/10	Lean startup mentality/methodology	**FIRST PRESENTATION:** Initial thinking on problem; update on meeting with problem sponsor (schedule permitting)
9/17	Mission Model Canvas	Further status updates and initial ideation
9/24	Beneficial Discovery pt. 1 – Sponsor management	Early difficulties and how to adapt
10/1	Beneficial Discovery pt. 2 – Discovery	Sponsor management **REMINDER: Group paper due this week**
10/8	Value Propositions and MVP pt. 1 – Value Proposition	Beneficial Discovery **REMINDER: first personal reflection due this week**
10/15	Value Propositions and MVP pt. 2 – Mission fit and MVP	Value Propositions

10/22	Mission Achievement	What does your MVP look like? Who is your most important beneficiary?
10/29	Buy-in and Support	Further evolution of MVP in light of mission achievement
11/5	Solution Deployment **ELECTION DAY – GO VOTE**	Where are you getting the most buy-in? Where are you getting pushback?
11/12	Resources and Key Partnerships	Status of MVP and what its deployment would look like
11/19	Mission/Budget Reflections and Dual Use	Identify key partnerships in creating/deploying MVP
11/26	Design, interview, draft day	**No presentations for Thanksgiving holiday**
12/3	Government Report and White Paper Drafting Etiquette	Wrap up presentations for final presentation and papers
FINALS WEEK	**Final Presentations**	**See below for final presentation expectations**

Course Success

Students are expected to develop a comprehensive understanding of the national security domain, actively engage in beneficiary discovery, and demonstrate expertise in utilizing H4D tools and resources. Course quality for students is measured by the following indicators:

- Demonstrable understanding and empathy of the domain. I.E., students appreciate the environment of the DoD/DoS, have empathy for civilian and uniformed personnel work and impact of the problem/solution
- Teams conduct a minimum of 100 touchpoints, which include
    - Individual Interviews
    - Incidental domain communication (conversation in a hallway, for example)
    - Group Interviews/Discussion
    - Domain Immersion (right seat ride)[1]
    - Surveys
- Use of H4 Toolbox and terminology during weekly presentations/recordings/discussions
- Expertise with the use of the tools/resources employed during H4 (MMC, VPC, discovery, receiving feedback, presentations, domain insights)

[1] https://www.army.mil/article/5843/u_s_army_europe_military_police_rip_into_iraq_mission

Technology

Personal technology is a crucial component of in-class activities, as computers, phones, tablets, etc. will be of significant aid to teams working on in-class assignments. Presentations necessarily require some level of technology in the classroom. While we encourage the use of personal devices, this should not be abused, and devices should not be used for personal business during lectures and/or presentations. If instructors notice you misusing your devices, you will be asked to put them away.

Free Business Model Canvas for online collaboration:

https://canvanizer.com/choose-canvas

Mission Model Canvas:

https://next.canvanizer.com/demo/mission-model-canvas?utm_source=newcanvas&utm_medium=link_page&utm_campaign=next

Supplemental Materials and Resources

- **Business Model Canvas**
- **Mission Model Canvas**
- **Value Proposition Canvas**

Useful websites

- https://www.strategyzer.com
- https://ecorner.stanford.edu
- https://ecorner.stanford.edu/contributor/steve-blank/
- https://leanstartup.co
- https://medium.com/swlh
- https://www.boldare.com/blog/lean-startup-innovation-accounting/
- https://library.d3center.ca/v05/docs/en/understand-your-customer#

Grading Policies

This course is team-based and 55% of individual student grades is derived from team progress and the final project. Student peers also grade individual contributions to teams. Grades are determined by the following breakdown:

Team learning (55%)

- The team will prepare a brief (5-page) written discussion four weeks after problems are distributed, discussing how their thinking has evolved around solving their problem, and their early thoughts on prototyping. **Due (tentatively) October 1th by 11:59 pm**. (5%)
- The team will prepare a brief (5 to 8-page) draft white paper of their minimum viable product and its government and commercial (dual use) applications, for

potential submission to sponsors. White papers will include sources, processes, and a rough order of magnitude, with a review session and examples provided during class. **Due Reading Day by 11:59 pm**. (5%)
- Prepare a weekly 15-minute presentation for every class summarizing key learnings from the course. (15%)
- Prepare a 15-minute final lessons-learned presentation summarizing key learnings from the course. (20%)
- Feedback on team's commitment from their Sponsor and Mentor (10%)

Individual learning (45%)
- Personal contribution to team efforts (30%)
    - Conduct and document approximately 60 touch points/interviews over the course. Students will keep a log of interviews in which they participated, the dates and times, and any relevant notes (10%)
    - Individual contribution weekly presentations. To ensure all students participate and gain presentation experience, it is expected each team member will have some part in each weekly presentation. The teaching team will log and grade on the level of participation in weekly debriefs (20%)
- Write a **brief** SWOT analysis or bulleted list of no more than 1 page to chart your thoughts and progress in the course. (5%) **Due on October 8 by 11:59 pm.** Questions to ask yourself when writing this:
    - What is the most important thing that you have learned thus far?
    - How well do you understand the problem that you've been given?
    - In what areas do you need to improve your understanding and how will you do this going forward?
    - What key challenge(s) have you faced in the team dynamic?
- Write a final reflection of no more than 1000 words about your experience on the course. Reflect on the key skills and knowledge you have learned in this course that you think will be most useful to you and why. Finally, consider the utility of Lean Start-up methodology and the application of this to your problem. (10% UG, 5% G) **Due on Reading Day**
- **GRADUATE STUDENTS:** Identify and submit an abstract related to your problem set to a relevant conference in your field for either a poster or panel session. The white paper can be used in part for the draft of said abstract. Examples of successful conference submissions can be provided should they be helpful in drafting (5%) **Due on Reading Day (or by conference submission deadline)**

Incomplete Grades

Per University policy, "the mark of incomplete (I) shall be reported only when a portion of the work assigned during the semester has not been completed either because of the necessary absence of the student or some other reason equally satisfactory to the instructor, and when, in the instructor's judgment, the work already done by the student must be of passing quality. A grade of incomplete implies that faculty and student will work together towards completion."

Undergraduate and graduate students are bound by differing policies regarding temporary grades, such that "[u]ndergraduate students must complete all outstanding work on a schedule determined by the instructor and by the end of the third week of the following semester. Exceptions to this deadline are made by the Dean of Students or designee with the consent of the instructor. Once the student submits the outstanding work or completes the final assessment, the instructor must submit a change of grade within 10 working days. If the student does not submit outstanding work by the agreed upon deadline and has not been granted an exception, the instructor will calculate the student's grade based on work completed for the course."

For graduate students, "[i]f all work required to change a mark of "I" or "X" is not submitted to the University Registrar within 12 months following the end of the semester or session for which the mark was recorded, or within a shorter period of time specifically designated by the instructor, no credit is allowed for the course. For grades of "I," it is the graduate student's responsibility to reach and to maintain an understanding with the instructor concerning the timely completion of the work. For grades of "X," it is the graduate student's responsibility to seek the required permission to take the final examination from the Graduate School as soon as possible after it has been missed."

IED - Final Presentation

On the last day of class (December 7th) each team will present a 15-minute "Lessons Learned" presentation (two-minute video summarizing the course journey followed by an eight-minute final presentation). Each presentation will be followed by a five-minute Q&A from the teaching team.

The goal of the presentation is to communicate what was learned over the duration of the course and how it was learned. The focus should be on how evidence was gathered and how it impacted the team's understanding of its business/mission models while building an MVP. Students should incorporate course concepts and language throughout the presentation: Beneficiary Discovery, iterations, pivots, restarts, experiments, MVPs, evidence.

Final Presentation Details: Strategy, Tactics, and Resources

Students should describe how beneficiary discovery and MVPs were used to evolve the mission model through iterations and how the accumulation of evidence outside the classroom influenced pivots.

Tactics to employee include:

- Initial hypotheses
- Quotes from beneficiaries that illustrate learnings insights
- Diagrams of key parts of the MMC
- Pivot stories
- Screenshots of the evolution of MVP

- Demo of final MVP
- Bring any “show and tell” items

View video and presentation examples here:

https://steveblank.com/2021/06/08/hacking-for-defense-stanford-2021-lessons-learned-presentations/

Two-Minute Video Details

The two-minute video teams should create as part of their final presentation should be *shown at the beginning* of their final presentation. The video should summarize the beneficiary discovery journey, highlighting the key beneficiary insights that took the team from its initial idea to final solution. The quality of the storytelling is critical and should be prioritized over high production value.

Videos should be personal and include the team and key “aha” moments. The video is about the discovery process, and is not a marketing video for the solution or final product.

Final Presentation Tips

This is not a Y-Combinator Demo Day. Student teams have learned a lot and should highlight this learning and the accompanying process.

Student teams cannot capture everything learned throughout the course in a ten--minute presentation, and this is not the objective. The final presentation is partially an exercise in distilling the most critical, surprising, and impactful aspects of the learning process.

Final presentations should not be high-level to an extent that they provide an overview with no details. This will lose the audience and it should be clear why the Mission Model Canvas evolved the way it did.

Students should include anecdotes about specific beneficiary discovery interviews that support their “what we learned story” and should draw upon insights recorded in weekly blog/write-ups.

Demos, prototypes, screenshots, etc. should be included in final presentations to illustrate the learning process - presentations should not only convey WHAT the product/solution is, but WHY the product is (what was learned from beneficiaries that shaped the product).

A final draft of the team’s presentation slides should be uploaded the night before class, by December 1st at 5 pm. The teaching team will provide a final review and send comments the same evening.

IED Course Policies

Hacking for Defense is different from most university courses and employs elements students may not have previously encountered.

The "Flipped Classroom" Model

The "flipped classroom model" introduces students to course content material before the scheduled class meeting time. Classroom time is used to deepen the students' understanding of the student teams' problem through problem-solving activities and discussions facilitated by the educator. The student team's "problem" is a scoped national security and/or defense problem statement written by the government problem sponsor and validated before being sent to the university.

IE4D students primarily learn by doing. The course teaches students to apply skills while working on a real-world problem. The program does this by:

- Teaching Lean LaunchPad theory outside of the classroom in the form of online lectures, podcasts, articles, blogs, and videos.
- Applying the theory to the government problem outside of the classroom.
- Using class time to present the results of applying theory and concepts to their defense problem. Instruction is in the form of feedback from the teaching team and peers to provide course corrections (either in their understanding of theory or to their problem specifically).

By using the flipped classroom model, student presentations are focused on feedback and discussion. This in-class discussion draws generalizable learning points from the specifics of each live case. These learning points are summarized and tied together to form the backbone of the pedagogical framework. Meaning, the Lean LaunchPad method draws its general framework from the specific experiences of the students. Discovery (the student team's weekly beneficiary interviews) becomes the core learning process in this approach. H4D emphasizes experiential learning as the paradigm to engage the students in testing the hypotheses of their models.

The Continuous Feedback Loop

H4D enables a continuous feedback loop between instructors and students as a way to simulate the intensity of a start-up and encourage and challenge students to test their own hypotheses verbally. It is a crucial part of the course. H4D considers the continuous feedback loop an open conversation between the teaching and student teams in front of the class. The instructor initiates feedback by asking student teams to elaborate on their methods. The instructor then follows up with questions that will contribute to the development of their solution. The discussion is not a one-sided weekly verbal assessment. Instead, the feedback is an interactive discovery of the student team's thinking and a way to guide without being prescriptive or directive.

Plagiarism

Plagiarism or any other form of academic misconduct will not be tolerated under any circumstances, for any reasons. The use of any material not original to the student must be properly cited; please contact course instructors for proper citation methods should you be concerned. Any instances of suspected misconduct will be resolved through the methods as outlined in the Student Code. Allegations of academic misconduct will be reported to the relevant authorities within the University, and any sustained findings of misconduct will result in an automatic grade of 0, and subsequent failure of the course. You can find more about the academic misconduct policy and your rights as a student here: https://community.uconn.edu/academic-misconduct/ and Appendix A of the Student Code (https://community.uconn.edu/the-student-code-appendix-a/).