Hacking for Defense (H4D) University Program

WHAT IS H4D?

• It’s a University Course that brings the brightest engineering, business and policy students together to work on government sponsored national security problems over the course of a semester.

• In H4D courses, student teams receive real-world national security problems sourced from DoD agencies.

• Teams are instructed in and apply Lean Startup principles in order to iteratively develop and test potential solutions.

• By the end of the course, the team will have interviewed an extensive number of stakeholders, and developed a minimally viable product concept that addresses the needs of their DoD Sponsor.
• The H4D Course was designed by Steve Blank, Pete Newell, and Joe Felter

• The course was originally an experiment with Stanford University in 2015, advised by former Secretary of Defense, William Perry

• First taught as an official course at Stanford University in 2016
H4D Today

• A University entrepreneurship course based on core principles of the Lean Start-up Methodology

• Sponsored by DoD’s National Security Innovation Network (NSIN) delivered in partnership with BMNT and Common Mission Project

• H4D is recognized by the DoD as an innovation capability

• Congressionally supported

• Taught at over 37 universities across the United States
HD4 is taught Nationwide

1. Arizona State University
2. Colorado School of Mines
3. Colorado State University
4. Columbia University
5. Defense Acquisition University
6. Duke University
7. Georgetown University
8. Georgia Institute of Technology
9. Indiana University
10. James Madison University
11. National Defense University
12. Naval Postgraduate School
13. New York University
14. North Carolina State University
15. Rochester Institute of Technology
16. San Diego State University
17. South Dakota School of Mines & Technology
18. Stanford University
19. Texas A&M University
20. United States Air Force Academy
21. United States Military Academy at West Point
22. University of Alabama - Huntsville
23. University of Alaska - Fairbanks
24. University of California - Berkeley
25. University of California - Davis
26. University of California - San Diego
27. University of Chicago
28. University of Colorado - Boulder
29. University of Michigan
30. University of Pittsburgh
31. University of Southern California
32. University of South Florida
33. University of Southern Mississippi
34. University of Texas - Austin
35. University of Texas - Dallas
36. University of Virginia
37. University of West Florida

*Bold indicates a Fall 2020 University

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The flipped classroom concept:

• In class each week, student teams brief their findings from beneficiary interviews

• Professors provide guidance/mentorship to the student teams in real time during weekly presentations

• Professors provide continuous feedback to the students to simulate the intensity of a start-up

Connecting the Classroom to Real-World Problems
H4D is Problem-Based and Rigorous

**Pre-Class**
- Problem sourcing & curation
- Universities and student teams select problems to work on

**In-Class**
- Student teams apply Lean Start-Up, test hypotheses, create MVPs
- Student teams present their MVP at the end of the semester

**Post-Class**
- Fully validated problem
- World class market research
- Energized ecosystem of problem solvers
- Common language and framework
- Strategy / pathway forward

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The H4D Ecosystem

- Department of Defense (and other relevant agencies)
- Student Teams
- Teaching Teams
- Problem Sponsors
- Government Mentors
- Industry Mentors
Typical H4D Course Composition

- Housed in political / social science, engineering, and business programs
- Two professors
- One - three teaching assistants
- Class meets on a weekly basis

*Knowledge of DoD not required*
Role of the H4D Teaching Team

- Teach students how to form hypotheses and test them through beneficiary discovery
- Build Minimum Viable Products (MVPs)
- Coach students in extracting insights from their own data
- Hold students to performance standards - 10 interviews and updated MVP weekly
- Provide advanced lectures about the DoD and H4D methodology
Typical H4D Student Team

- Graduate-level course listing with select undergraduate enrollment
- Three - five students per team
- Dedication of 15 - 20 hours per week
- Multi-disciplinary — technical and non-technical backgrounds
- Taking H4D for university credit

*Knowledge of DoD and IC are not required*
Role of the H4D Student Team

- Interface with their DoD Problem Sponsor on a weekly basis
- Conduct interviews (beneficiary discovery) to validate the problem
- Test Minimum Viable Products (MVPs)
- Identify potential solution pathways
The H4D Problem Sponsor

- Problem Sponsors are military personnel and government civilians — often a senior non-commissioned officer, field grade officer, or civilian equivalent

- Has knowledge of, or experience with, the pain point of the problem

- Can navigate student teams to potential end-users, beneficiaries, and individuals who experience the problem
Role of the H4D Problem Sponsor

- Educate student team on the problem area and pain points
- Navigate student team to their first 15 interviews
- Engage with the student team three-five hours per week
- Examine ways to transition student team MVPs into the DoD

Megan Lacy, Co-Founder of Lumineye
H4D Benefits

• **Educating the Next Generation Workforce** to validate a public problem and pathways for deployment

• **Building New Mission-Driven Entrepreneurs** focused on solving public problems

• **Connecting Unique Expert Networks** around each problem area that cut across government, academia, and entrepreneurs/start-ups

• **Developing Viable Solutions** in the form of new policies, business practices, technologies, and companies

_Solving the Critical Challenges of Our Time_
NSIN, the National Security Innovation Network, is an unrivaled problem-solving network that adapts to the emerging needs of those who serve in the defense of our national security. We are dedicated to the work of bringing together defense, academic and entrepreneurial innovators to solve national security problems in new ways.

https://www.nsin.us/
**H4D – MDA and Redstone Arsenal Sponsors**

**X-Force Fellowship**

**X-Force Capstone**

**Georgia Tech – STING program**

**EDUCATORS**

Duke Univ. – Phoenix Program

Texas A&M University

University of Alabama

In Huntsville

**SPONSORS**

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US Army Futures Command – Assured Positioning, Navigation and Timing

Quality, Safety and Mission Assurance Directorate – Radiation Hardening

Innovation, Science and Technology Directorate – Quantum Algorithms; Chip Resiliency; AI/ML

Chief Architect – Advanced Tracking Algorithms; Cyber Security

Test Directorate – Network Security

Technical Intelligence / Engineering

Continually Growing the pool of Program Sponsors
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