

**University of California, Berkeley**  
**Blum Center for Developing Economies – Development Engineering**

**DevEng 290:**  
**Hacking for Local (H4Local)**  
**Spring 2019**

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**Class Meetings:**

- Thursday, 1-4 pm, Blum 100

**Webpage:** <https://hackingforlocal-oakland.weebly.com/>

Please read all information on the website. There is important information there that is not included in the syllabus for which you will be responsible.

**Course Description**

Cities face complex challenges and are pursuing creative approaches to solve them - many times with lower resources than optimal. Oakland, in particular, serves as a model for civic innovation - a large city with a diverse population of people, business, and organizations, embodying complex issues ranging from housing, transportation, pollution, to social issues of policing and human trafficking. Oakland also models success with a track-record of innovative programs and initiatives in policy, social, and environmental arenas.

Hacking 4 Local is designed to provide students the opportunity to learn how to design solutions to problems that face complex municipal organizations, including the City of Oakland, to better address the challenges faced at the local level including homelessness, hunger, infrastructure, and education. Large institutions come with varied constraints and cities are no different. Using

Lean Startup Theory and Human-Centered Design, this course will provide a platform that can develop solution prototypes that match Oakland users' needs in weeks, not months, or years. Government offices, related organizations (such as nonprofits or mission-oriented businesses), or investors, may provide follow-on funding to student teams for further refinement and development of solution prototypes.

Over the course of the semester, students in groups of 4-5 will tackle a different problem with the help of mentors, advisors, and problem sponsors. The class follows the Lean Startup methodology extended to working in the social sector. The class is taught in a reverse classroom style where each week the student team present their progress to the class and receive direct feedback from experts in the field. At the end of the class students will present their journey in a final presentation and hopefully will have designed and validated a solution to the problem they selected.

### **Desired Course Outcomes:**

Students can expect to depart the semester understanding customer-driven design and lean-launch methods, tools and processes. They will also learn how to work on multi-disciplinary teams to design solutions to local socio-technical challenges.

### **Expectations:**

This is a three-unit course. We have structured the work to be done inside and outside the class accordingly. University policy establishes that classes consume three hours per unit per week of your time; in our case you will have three hours per week in the classroom, and can expect to spend at least six hours per week outside class working on developing a deep understanding of the complex social, political, and technical systems we are studying and then on developing and testing solutions to shift those systems. As your team is presenting each week in class, attendance is required.

### **Reading Materials:**

The readings for this course are all available through bCourses and links included in this syllabus. Core resources we will be pulling from include:

*Business Model Generation*: Osterwalder, et al.

*Value Proposition Design*: Osterwalder, et al .

*Startup Owner's Manual*: Blank & Dorf

*Talking to Humans*: Constable & Rimalovski

*Thinking in Systems*: Donella Meadows

[theDesignExchange.org](http://theDesignExchange.org): human-centered design methods

### **Deliverables:**

The class will encompass four core components:

1. Each week, your team will conduct 5+ interviews and complete an interview analysis form. These are an integral part of your deliverables. It's how we measure your progress.
2. Each team will present a weekly in class 8-minute summary of progress
3. Team Final Deliverables
  - a. Teams building a physical product must show us a bill of materials cost and a prototype.
  - b. Teams building a web product must build the site, create demand and have users using it.
  - c. Teams building a mobile product are expected to have working code and have users using it.
  - d. Teams building a service or policy solution must show implementation plan and anticipated cost of delivery.
4. Final presentation of the class journey on your project.

## **BCourses:**

We will make extensive use of the course bCourses website to both communicate information to you and to converse with you about your homework and your projects. You will find the course listed on <http://bCourses.berkeley.edu/>. Once you have formed your project groups, we will set up group pages on which we expect you to store your working documents for your project. The faculty will review the group pages regularly to provide feedback on your work. Our experience is that the teams that heavily use their bCourses pages and email connections do better in the class, and we strongly encourage you to use them.

## **Course Policies**

**Technology Policy:** Use of laptops, phones, tablets etc. for purposes not related to class is not allowed in lecture.

**Accommodation Policy:** If you need religious or disability-related accommodations in this class, if you have emergency medical information you wish to share with us, or if you need special arrangements in case the building must be evacuated, please inform one of the instructors immediately. Please see us privately after class or during office hours.

**Inclusion:** We are committed to creating a learning environment welcoming of all students that supports a diversity of thoughts, perspectives and experiences, and respects your identities and backgrounds (including race/ethnicity, nationality, gender, class, sexual orientation, gender identity, religion, ability, etc.) To help accomplish this:

- If you have a name and/or set of pronouns that differ from those that appear in your official records, please let us know.

- If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with us. We want to be resources for you.
- We (like many people) are still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to us about it.
- As a participant in this class, you should also strive to respect the diversity of your classmates.

### **Berkeley's Honor Code:**

We expect the students to act with honesty, integrity, and respect for others. Note the following link to UC Berkeley's principles of community:

<http://diversity.berkeley.edu/principles-community>.

### **Basic Needs:**

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Cal Student Central Office via phone (510 -664-9181) or online (<https://studentcentral.berkeley.edu>). UC Berkeley's Basic Needs Security website also provides an overview of support options:

<http://basicneeds.berkeley.edu/>. Furthermore, please notify the faculty if you are comfortable in doing so. This will enable us to provide any resources that we may possess.

### **Grading:**

Your course grade will be determined as follows:

- 10% Individual participation in class
- 30% Out-of-the-building progress as measured by interview notes, mission model canvas update, and content-driven assignments. Each week, team members must complete required number of interviews and update the Mission Model Canvas.
- 20% Team weekly "lesson learned" update presentation
- 30% Team final deliverables and presentation
- 10% Individual Reflection

This total score is multiplied by a "peer grading multiplier" as assigned to you by your team at the end of the quarter.

### **Shared Materials**

Your weekly presentations and final Lessons Learned presentations will be shared and visible to others. We may be videotaping and sharing many of the class sessions.

### **Your Work in this Class is Open Sourced**

Anything you develop during this class (software, hardware, ideas, etc.) is open--sourced. You do not give up any IP rights of anything you bring to the class. Your software, technology, or hardware IP, if not shown or uploaded as part of presentations to the class, is not considered open-sourced.

## **Minimum Viable Product (MVP)**

Following concept generation, you are expected to present progress on your MVP each week. And that MVPs are not reduced functionality prototypes but early on are those examples that work to validate a hypothesis. They can be anything from a mockup to a wire frame to a landing page to an organizational approval flow chart.

### **H4L Final Assignments:**

- *8 min Presentation*

*Deliverable:* On the final day of class, each team will present a 10 minute "Lessons Learned" presentation (2 min video summarizing journey; 8 min final presentation) and will have 5 min Q&A from the teaching team.

*Goal:* Communicate what you learned in 13 weeks. Show what you learned and how you learned it.

*Use the language of class:* interview, iterations, pivots, restarts, experiments, MVPs, evidence. The focus of your presentation will be on how you gathered evidence and how it impacted your understanding of your business models, while you were building your MVP.

*Strategy:* Tell us how you used customer discovery and MVPs to evolve your mission model through iterations, and how the accumulation of evidence outside the classroom led you to pivot.

- *2 min Video*

In addition to your 8 minute presentation, create a 2 minute video to be *shown at the beginning* of your final presentation. The video should summarize the customer/beneficiary discovery journey your team went on, highlighting the key customer insights that took you from your initial idea to today. Storytelling quality is critical. High production value is not (some of the best videos have been very straightforward).

Make it personal include the team in the video as well as key "aha" moments. This video is about the discovery process. It is NOT a marketing video for your product/service.

## Course Summary and Schedule:

Date	Team Presentation	Lecture Topic
<b>Week 1</b> <b>Jan 24</b>	No presentation	<p><b>Course Introduction: Hacking 4 Local</b></p> <p>We will cover course logistics and requirements and then develop the motivation and framework for the course. Come to class prepared to discuss why you were interested in joining the class and how you might help a potential team. We will also introduce the potential projects and project sponsors. Finally, we will go over techniques for conducting interviews as well as the mission model canvas.</p> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>Register for Udacity Course: How to Build A Startup <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> <li>Complete Lesson 1: Before You Get Started and Lesson 2: What We Now Know</li> </ul> <p><b>Read:</b></p> <ul style="list-style-type: none"> <li>The Mission Model Canvas - An Adapted Business Model Canvas for Mission-Driven Organizations <a href="https://steveblank.com/2016/02/23/the-mission-model-canvas-an-adapted-business-model-canvas-for-mission-driven-organizations/">https://steveblank.com/2016/02/23/the-mission-model-canvas-an-adapted-business-model-canvas-for-mission-driven-organizations/</a></li> <li>The Reductive Seduction of Solving Other People's Problems <a href="https://brightthemag.com/the-reductive-seduction-of-other-people-s-problems-3c07b307732d">https://brightthemag.com/the-reductive-seduction-of-other-people-s-problems-3c07b307732d</a></li> </ul> <p><b>Individual Assignments:</b></p> <ul style="list-style-type: none"> <li>Vote on project preferences</li> <li>Bring 'Individual Profile' to class for Team Introduction</li> <li>Write initial blog post answering: <ul style="list-style-type: none"> <li>How do you envision this class contributing to your personal development and growth?</li> </ul> </li> </ul>
<b>Week 2</b> <b>Jan 31</b>	No presentation	<p><b>Introduction to Teams and Governmental Issues</b></p> <p>This week we will launch teams, spending time getting to know each other as well as unpacking what are the perspectives and skillsets present on each time and where gaps exist. We will be joined by Dan Lindheim (former Administer for the City of Oakland) who will give an overview of how city government works. We will also discuss how to frame and begin to understand messy systems challenges.</p>

		<p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>Complete Lesson 3: Business Models and Customer Development <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> </ul> <p><b>Read:</b></p> <ul style="list-style-type: none"> <li>Problems are Interconnected – And so are Solutions <a href="http://donellameadows.org/archives/problems-are-interconnected-and-so-are-solutions/">http://donellameadows.org/archives/problems-are-interconnected-and-so-are-solutions/</a></li> <li>Framing and Reframing: Core Skills for a Problem-Filled World</li> </ul>
<p><b>Week 3</b> <b>Feb 7</b></p>	<p>Problem Frame/Challenge research</p>	<p><b>Understanding the Broader Problem Context and Stakeholders</b></p> <p>This week we will begin to think about how to understand the broader problem context. We will be joined by Ricardo Huerta who will talk about effectively working with diverse stakeholders to get solve problems in Oakland. We will talk about beneficiaries and stakeholders, as well as go over tools for identifying stakeholders and the systems in which they work.</p> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>Complete Lesson 4: Business Models and Customer Development <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> </ul> <p><b>Read:</b></p> <ul style="list-style-type: none"> <li>Three Keys to Unlocking Systems Level Change <a href="https://ssir.org/articles/entry/three_keys_to_unlocking_systems_level_change">https://ssir.org/articles/entry/three_keys_to_unlocking_systems_level_change</a></li> </ul> <p><b>Team Assignment:</b></p> <ul style="list-style-type: none"> <li>Include in your presentation a stakeholder map that shows people that are connected to your problem as well as the relationships between them.</li> </ul>
<p><b>Week 4</b> <b>Feb 14</b></p>	<p>Problem Context and Key Stakeholders</p>	<p><b>Analyzing Design Research</b></p> <p>During this class session we will go over how to go about analyzing qualitative design data including observations, interviews, and contextual research. We'll use this class time to work with you on applying some of the framing and reframing tools to your project data. Please bring all of your customer and user needs data – interview notes, photographs, etc. – to class with you to use in these in-class exercises. Readings and exercises in this module will focus on interpreting, analyzing and framing your design research as described in <i>Analyze</i> of theDesignExchange.</p> <p><b>Guest Speaker:</b> Dr. Vivek Rao, former designer at IDEO and current UC Berkeley lecturer</p> <p><b>Read:</b></p>

		<ul style="list-style-type: none"> <li>○ Readings from theDesignExchange Analysis Collection – <a href="https://www.thedesignexchange.org/collections/47">https://www.thedesignexchange.org/collections/47</a> <ul style="list-style-type: none"> <li>○ 2 x 2: <a href="https://www.thedesignexchange.org/design_methods/37">https://www.thedesignexchange.org/design_methods/37</a></li> <li>○ Reframing: <a href="https://www.thedesignexchange.org/design_methods/82">https://www.thedesignexchange.org/design_methods/82</a></li> <li>○ Powers of Ten: <a href="https://www.thedesignexchange.org/design_methods/78">https://www.thedesignexchange.org/design_methods/78</a></li> <li>○ Why-How Laddering: <a href="https://www.thedesignexchange.org/design_methods/337">https://www.thedesignexchange.org/design_methods/337</a></li> <li>○ Empathy Map: <a href="https://www.thedesignexchange.org/design_methods/61">https://www.thedesignexchange.org/design_methods/61</a></li> <li>○ Competitive Analysis: <a href="https://www.thedesignexchange.org/design_methods/154">https://www.thedesignexchange.org/design_methods/154</a></li> <li>○ Kano Analysis: <a href="https://www.thedesignexchange.org/design_methods/67">https://www.thedesignexchange.org/design_methods/67</a></li> </ul> </li> </ul> <p><b>Read:</b></p> <ul style="list-style-type: none"> <li>○ “Get Inside the Lives of Your Customers” on bCourses.</li> <li>○ Turn Customer Input into Innovation, <a href="http://hbswk.hbs.edu/archive/2815.html">http://hbswk.hbs.edu/archive/2815.html</a></li> </ul> <p><b>Team Assignment:</b></p> <ul style="list-style-type: none"> <li>• Include in your presentation an analysis of your design research to date.</li> </ul>
<b>Week 5 Feb 21</b>	Design Research	<p><b>Identifying Leverage Points</b></p> <p>This week we will focus on how to identify key leverage points for intervening in complex systems. We will discuss the difficulties behind behavioral change and how we might go about creating addressing the problems of interest.</p> <p><b>Guest Speaker, TBD</b></p> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>○ Complete Lesson 5: Value Proposition <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> </ul> <p><b>Read:</b></p> <ul style="list-style-type: none"> <li>○ Leverage Points: Places to Intervene in a System, Donella Meadows</li> </ul> <p><b>Individual Assignment:</b></p> <p>Each team member is to INDIVIDUALLY generate 10 concepts and post to bCourses and bring to class. A “half-sheet” form will be provided on bCourses for you to use.</p>
<b>Week 6 Feb 28</b>	Leverage Points in the System	<p><b>Concept Generation and Value Propositions: Structured Methods</b></p> <p>This class will focus on structured methods for concept generation, such as Morphological Matrices, Functional Decomposition, etc. After reviewing your teams’ original 10 individual concepts, double the number through brainstorming and structured methods (e.g., for a team of 5, you should strive for a total of 100 concepts).</p>



		<p><b>Guest Speaker:</b> Andrew Hening, Director of Homelessness Outreach, City of San Rafael</p> <p><b>Read:</b></p> <ul style="list-style-type: none"> <li>• “Morphological Charts” (similar to Attribute Listing), <a href="http://www.ifm.eng.cam.ac.uk/research/dmg/tools-and-techniques/morphological-charts/">http://www.ifm.eng.cam.ac.uk/research/dmg/tools-and-techniques/morphological-charts/</a></li> <li>• Assignments from theDesignExchange –</li> <li>• 3-12-3 Brainstorm: <a href="https://www.thedesignexchange.org/design_methods/106">https://www.thedesignexchange.org/design_methods/106</a></li> <li>• 6-3-5 brainwriting: <a href="https://www.thedesignexchange.org/design_methods/107">https://www.thedesignexchange.org/design_methods/107</a></li> <li>• Attribute listing: <a href="https://www.thedesignexchange.org/design_methods/109">https://www.thedesignexchange.org/design_methods/109</a></li> <li>• Heuristic Ideation: <a href="https://www.thedesignexchange.org/design_methods/125">https://www.thedesignexchange.org/design_methods/125</a></li> </ul>
<p><b>Week 7</b> <b>Mar 7</b></p>	<p>Presentation of Initial Concepts and Value Propositions</p>	<p><b>Initial Design Review</b></p> <p>This week we will present our initial solution concepts, connecting the proposed solution to core needs. We will invite an external panel to give feedback. We will also be joined by a speaker who will talk about implementing solutions in government and how to understand the difference between individuals that are paying for your solution vs. the true users and beneficiaries.</p> <p><b>Guest Speaker:</b> Judi Brown, COO of Civic Makers</p> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>○ Complete Lesson 6: Customer Segments <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> </ul> <p><b>Read:</b></p> <ul style="list-style-type: none"> <li>○ Bansal, Sarika. August 21, 2014. “Innovation Within Reach,” New York Times, Opinion, <a href="https://opinionator.blogs.nytimes.com/2014/08/21/innovation-within-reach/">https://opinionator.blogs.nytimes.com/2014/08/21/innovation-within-reach/</a></li> </ul> <p><b>Individual Assignment:</b></p> <p>Complete the mid-semester teaming evaluation.</p>

<b>Week 8</b> <b>Mar 14</b>	Beneficiaries	<p><b>How to Make Things Happen In Government (Design, Deployment and Adoption)</b></p> <p>In this class, we will focus on the entrepreneurial mindset and how to you go about deploying solutions in a government context. We will talk about getting solutions adopted by a diverse array of stakeholders and striking a balance between scalable solutions as well as solutions that are contextually appropriate.</p> <p><b>Guest Speaker:</b> Virginia Hamilton, previous Design Thinking Lead, Dept. of Labor</p> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>Complete Lesson 7: Channels <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> </ul>
<b>Week 9</b> <b>Mar 21</b>	Design, Deployment & Adoption	<p><b>Cultivating Buy-in and Support for Your Ideas</b></p> <p>This week, our class will focus on how to cultivate buy-in and support for your ideas. We'll be joined by entrepreneurs have focused on mission-oriented business who will discuss how to deliver solutions to the intended beneficiaries.</p> <p><b>Invited Guest Speaker:</b> Steve Blank, Lean Start Up</p> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>Complete Lesson 8: Customer Relationships <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> </ul>
<b>Spring Break</b>	<b>No Class</b>	<b>No Class</b>
<b>Week 10</b> <b>Apr 4</b>	Buy-in & Support	<p><b>Developing your MVP and Mission Achievement</b></p> <p>This week we will talk about developing a minimum viable product. We will additionally discuss the difference between a minimum viable product and a prototype and when you use both. We will also cover mission achievement, and how to measure whether your solution is having the impact you intend.</p> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>Complete Lesson 9: Revenue Model <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> </ul>

		<p><b>Read:</b></p> <ul style="list-style-type: none"> <li>○ Experience Prototype, The Design Exchange <a href="https://www.thedesignexchange.org/design_methods/13">https://www.thedesignexchange.org/design_methods/13</a></li> <li>○ Sandhu, Jaspal S. "Measure early, measure often: rapid, real-time feedback in design for social innovation". Jan. 2013: <a href="http://poptech.org/e3_jaspal_sandhu">http://poptech.org/e3_jaspal_sandhu</a></li> </ul>
<p><b>Week 11</b> <b>Apr 11</b></p>	<p>MVP and Mission Achievement</p>	<p><b>Focus on Feasibility: Activities, Resources, and Partners</b></p> <p>In Week 11, we will focus on making things happen within and implementing potential solutions to your team's challenge. We will talk about how to find and work with strategic partners as well as the core resources needed to bring your ideas to fruition.</p> <p><b>Invited Guest Speaker:</b> Courtney Ruby, City of Oakland Auditor</p> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>○ Complete Lesson 10: Partners <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> <li>○ Complete Lesson 11: Resources, Activities and Costs <a href="https://www.udacity.com/course/how-to-build-a-startup--ep245">https://www.udacity.com/course/how-to-build-a-startup--ep245</a></li> </ul>
<p><b>Week 12</b> <b>Apr 18</b></p>	<p>Key Partners, Activities, Resources &amp; Partners.</p>	<p><b>Lecture: Costs, Drivers for Growth, Follow-on Funding + Storytelling</b></p> <p>This week we will discuss venture costs and how you might fund the expansion of your idea. We will additionally introduce you to storytelling techniques and cover strategies for developing your final deliverables.</p> <p><b>Invited Guest Speaker:</b> TBD, Storytelling</p> <p><b>Read:</b></p> <ul style="list-style-type: none"> <li>○ Scale = Partnership, Stanford Social Innovation Review <a href="https://ssir.org/articles/entry/scale_partnership">https://ssir.org/articles/entry/scale_partnership</a></li> </ul>
<p><b>Week 13</b> <b>Apr 25</b></p>	<p>draft final presentations</p>	<p><b>Beyond the Course</b></p> <p>The presentations this week will be drafts of your final presentations. The teaching team will workshop your presentations with you. We will also discuss options for how to continue making impact for the City of Oakland and other beneficiaries beyond the course. This week, we will also give class time for students to work on whatever is needed to prepare for the final presentations.</p>

<b>Week 14 May 2</b>	MVP + Final Presentation	<b>Final Project Expo</b> During the last week of class, we will invite guest speakers, stakeholders, and City of Oakland residents to hear about the progress made over the course of the semester. Students will present the story of their work as well as show final deliverables.
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