



CSU I-Corps™
Syllabus for Fall 2017 Cohort #8
TEAMS VERSION

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OVERVIEW

CSU I-Corps teams come from the CSU’s research community and enter the program with a commercialization idea to explore. The CSU I-Corps™ curriculum is a less-intense, downsized version of the Lean Start-up curriculum used by the I-Corps Nodes nationwide. Over three months, CSU I-Corps teams begin to develop a business model around their biotechnology, focusing first on the problem-solution fit and value proposition design. Successful teams typically find a credible product-market fit by the end of the course. At the end of the I-Corps program, teams will know how to use the business model canvas as a tool and how to use learning interviews when talking to potential customers, partners and experts. Overall, the program allows academic researchers and nascent entrepreneurs to better assess their biotechnology idea’s maturity, feasibility, and follow-on funding possibilities based on feedback from the regional entrepreneurial ecosystem and biotechnology market.

CSU I-Corps Learning Outcomes

Upon completion of the CSU I-Corps Short Course, participants should:

- 1. Communicate biotechnology ideas in a non-confidential manner to preserve intellectual property**

Assessment methods: Teams develop 2-minute descriptions of their biotechnology and its research basis, included as part of Lessons Learned presentations at final meeting. Evaluation panels (subject area experts [SMEs] & patent attorney on teaching team) will assess effectiveness of non-confidential presentations.

2. Deliver a presentation to a live audience and subject matter experts, including a lessons learned presentation deck and story

Assessment methods: Teams will develop 10-minute Lessons Learned presentations and present them to evaluation panels, consisting of external experts, during final immersion weekend.

3. Use the Business Model Canvas (BMC) framework, focusing on Value Proposition Design, to evaluate an early stage biotechnology.

Teams will describe The Problem (*What customer job/pain/gains can they address?*), a Problem-Solution Fit, and a Value Proposition (*What competitive advantages does the biotechnology have over current solutions?*).

Assessment methods: Teaching Team will collect and collate CSU I-Corps application answers as initial baseline for learning. The Teaching Team and external evaluation panels will assess evidence-based learning based on the evolution of each team's Value Proposition Design, based on updates during webinars and final lessons learned presentations.

4. Apply evidence-based approach to business model design by using Customer Discovery process to iterate hypotheses and assumptions.

Assessment methods: Teams design experiments and apply them by completing ~30 learning interviews over the course of the program. Throughout the program, the teaching team will track whether teams are formulating hypotheses, completing interviews and learning from their experiments, based on the completed CSU I-Corps Interview Template for each interview. Teaching Team will review the completed templates for consistency between assumptions/hypothesis and evidence-based learning reported. Feedback will be given in webinars, office hours and in comments on the homework submitted. In addition, evaluation panels (SMEs) will assess teams' learning, based on final presentations.

5. Show how evidence from Customer Discovery activities results in key learnings, leading to "persevere" or "pivot" decisions in the business model and how they influence future plans.

Assessment methods: Teams report on the trajectory of their learning by submitting a series of completed BMCs throughout the program and giving status updates during webinars. The Teaching Team will assess whether BMCs are changing over time. Feedback will be given in webinars and in comments on homework submitted. External panelists and teaching team will use final lessons learned presentations to assess learning and evolution of team's thinking based on market and expert feedback.

To assess "go/no-go" decisions for National Science Foundation (NSF):

The Teaching Team will review the team's ability to meet deadlines, the team's participation level (attendance, interviews completed, work submitted), and the evaluations from external Evaluation

Panels. In addition teams will self-report whether they want to advance their ideas or not as part of the national I-Corps Team program (\$50,000 grants from NSF). Together these data will lead to the Go/No-Go decisions submitted to NSF by CSUPERB.

CSU I-Corps Evaluation Criteria

Also available at: <http://www.csuperb.org/csucorps/team-evaluation/>

CSU I-Corps™ teams get out of their labs, innovation centers and classrooms and off campus to consult with life science advisors, experts, mentors, and potential customers or partners. As a result, teams get feedback continuously so that they hone product concepts, improve their understanding of biotechnology markets, and formulate commercialization pathways. Teams typically conduct ~30 learning interviews during CSU I-Corps short courses and summer sprints. Using the key principles of Lean Start-up, teams learn about evidence-based business model design. Teams use the [customer discovery process](#) to test hypotheses and assumptions underlying their initial business models. During a CSU I-Corps course, teams synthesize key learnings to evolve their problem-solution fit. They present their concepts and their learning stories through final, lessons learned presentations.

Teams are evaluated by the teaching team and, importantly, by panels drawn from the CSU I-Corps' network of alumni, life science industry professionals, and experienced entrepreneurs. The evaluation panel reviews the teams' presentations to assess the problem-solution fit, product maturity, and teamwork. The final evaluation panels may give special recognition to teams who demonstrate significant learning during the course and/or who identify a compelling entrepreneurial opportunity. Important evaluation criteria will include, but are not limited to:

- The [Problem-Solution Fit](#)
 - Value Proposition (What competitive advantages does your biotechnology have over current solutions?)
 - The Problem (What customer job/pain/gain are you trying to address?)
- The team's understanding of the initial customer segment served (early adopters/partners)
- The team's understanding of key partners needed (Which partners are important when?)
- The team's plan for developing the product (Is it feasible? What might be the capital investment required? What IP protection is needed? What technical or commercialization milestones do they need to hit in the next 3-6 months to move forward?)
- The team's understanding of market size and aspects of a multi-sided market (regulatory issues?), if applicable
- The team's tenacity, enthusiasm and story-telling skills
- The team's arc of learning, demonstrated by evidence-based evolution of their product/solution concept (based on customer, partner and/or expert interviews)

Fall 2017 CSU I-Corps Teaching Team

Susan Baxter is executive director of the California State University (CSU) Program for Education and Research in Biotechnology and PI of CSU I-Corps. Previously, Baxter was chief operating officer at the CSU I-Corps Site

National Center for Genome Resources, vice president of research at GeneFormatics, a tenured researcher at the New York State Wadsworth Center, and a research scientist at Monsanto Agricultural Company, where she received an Achievement Award for product development. Baxter has M.S. and Ph.D. degrees in chemistry (Northwestern University) and B.A. in chemistry (University of Virginia). Currently, she serves on boards at Biocom Institute and the California Life Sciences Institute.

LinkedIn profile: <https://www.linkedin.com/in/smbaxter/>

Alex DeNoble is a Professor of Entrepreneurship and Executive Director of the SDSU Lavin Entrepreneurship Center. He served as the 2015 President of the United States Association for Small Business and Entrepreneurship (USASBE) and currently on the board of the International Council for Small Business (ICSB). His areas of research and teaching expertise include entrepreneurship, corporate innovation and technology commercialization. He has published in such journals as IEEE Transactions on Management, the *Journal of Business Venturing* and the *Journal of Technology Transfer*. He has worked with numerous startups and has consulted with organizations such as Qualcomm, SDGE, and Siemens.

Linked in Profile: <https://www.linkedin.com/in/adenoble/>

Stanley Maloy obtained a PhD in Molecular Biology and Biochemistry from UC Irvine, was a postdoctoral fellow in Genetics at the University of Utah, then was on the faculty at the University of Illinois, Urbana-Champaign for 18 years. He is currently Professor of Biology and Dean of the College of Sciences at San Diego State University. He is an elected Fellow of the American Academy for Microbiology, and served as President of the American Society for Microbiology in 2005. Together with his brother, Stanley started his first company as an undergraduate. Since then he has consulted with large agricultural and pharmaceutical companies and small biotech companies. He has served on multiple Scientific Advisory Boards, and has played a role in several start-up Biotech companies, including serving as Chief Scientific Officer of Vaxiion Therapeutics Inc.

Linked in Profile: <https://www.linkedin.com/in/stanley-maloy-9831472/>

Tommy Martindale is the Director of the Technology Transfer Office at San Diego State University (SDSU), responsible for the protection and commercialization of technologies developed at SDSU. He supports SDSU by evaluating the patentability and market potential for faculty inventions, managing the protection of faculty-developed intellectual property, and commercializing campus technologies through licensing. Tommy is a member of the State Bar of California and is registered to practice before the United States Patent and Trademark Office.

Linked in Profile: <https://www.linkedin.com/in/tommy-martindale-710365b/>

Cathy Pucher works with aspiring entrepreneurs at SDSU's Zahn Innovation Platform Launchpad. Zahn Innovation Platform Launchpad helps SDSU students, faculty and staff launch a startup from their early stage ideas. Forty teams and over 100 students work concurrently to bring their idea to life while receiving mentoring, pro bono legal guidance, prototyping services, business acumen, and access to early stage funding in 24/7 co-working space on campus. Since opening its doors four years ago, one in ten teams has launched their business and collectively received \$3.8M in early stage funding. She helped create EvoNexus and served as their first Executive Director. EvoNexus is an incubator dedicated to simulating the growth of new high technology companies in San Diego. EvoNexus has

raised over \$1B since opening in Oct 2009. She brings 20+ years of experience in the high tech industry and has worked for established and start up technology companies. Mrs. Pucher earned a B.S. in Electrical Engineering at University California, San Diego.

Linked in Profile: <https://www.linkedin.com/in/cathy-pucher-340b5110>

READING:

Talking to Humans

<https://s3.amazonaws.com/TalkingtoHumans/Talking+to+Humans.pdf>

Value Proposition Design (Sneak Preview version only, 100 pages; set up a free Strategyzer account to view):

<https://strategyzer.com/value-proposition-design>

Business Model Generation (Preview version only, 72 pages):

http://www.businessmodelgeneration.com/downloads/businessmodelgeneration_preview.pdf

RESOURCES AND VIDEO LIBRARIES:

Lean LaunchPad Master Video Library: <http://venturewell.org/i-corps/llpvideos/>

Strategyzer Resources (sign in needed): <https://strategyzer.com/platform/resources>

University of Michigan Intellectual Property Video Library:

<http://mconnex.engin.umich.edu/intellectual-property/all-videos/>

U.S. Food & Drug Administration Learning Portal:

<http://www.fda.gov/Training/learningportal/default.htm>

CSU I-Corps Resources: <http://www.csuperb.org/csucorps/biosciences-site/resources/>

CSU I-Corps Shared Drive: Google Drive (folder links will be sent via email to ELs)

Webinar Platform: CSU I-Corps Zoom Meeting Room: <https://SDSU.zoom.us/j/421757489>

EXCEPT FOR THE FIRST WEBINAR (9/11/17), ALL WEBINARS RUN FROM noon – 1:30 pm.

See Schedule of Activities below.

CSU I-Corps Program Culture

- Biotechnology commercialization is a time- and cash-constrained process. Likewise, we have limited time and we're planning to push and challenge you to learn quickly. Just like real-world companies, we have no time (or money) to waste! Your team will be evaluated based on your tenacity – that is - your ability to work as a team, deliver on time, use your budget effectively, and show up as promised. You'll only keep up if you schedule recurring team meetings now!
- This is an intense program with a relatively high workload during the fall and winter break. The aim of I-Corps programming is to create entrepreneurial experiences "with all the pressures and demands of the real world." Previous teams report working between 60-100 hours over the term. This means teams spend 3-5 hours weekly reading, watching assigned videos, setting up and coordinating meetings with biotech experts, potential customers and partners, meeting with their industry mentor (IM), talking with customers, users and industry experts, and testing commercialization hypotheses.
- This is a "flipped classroom," experiential learning program. That means we expect CSU I-Corps teams to view videos and do some reading and homework before attending webinars. It means we expect you to meet with your team and Industry Mentor weekly to synthesize what you're learning and make plans to move forward in a coordinated way. It also means that you must "get out the building" and interview ~30 experts, potential customers or partners between September and January 11th.
- We'll be offering webinars and office hours during the fall to help you begin your search for a product-market fit. Each team needs to complete "homework assignments" before each webinar at noon on Wednesdays. Homework will be collected on an assigned, shared Google Drive Folder. Homework assignments and reports help us assess each team's arc of learning and whether they are keeping up with customer discovery activities (tenacity). Late submissions will be noted and go into the overall team evaluation shared with NSF. In addition, all instructors will assume you've done the homework, will call on teams to present during webinars, and will discuss new topics based on that assumption.
- CSU I-Corps webinars are only 1.5 hours long. That means you'll need to show up early to log-in and make sure your video and audio connections are working; late arrivals will be noted. If a team member cannot attend, you must contact Susan Baxter (sbaxter@mail.sdsu.edu); you cannot skip webinars.
- During each webinar, the instructors will call on teams to present their lessons learned and homework – this means you'll need to be ready to present to the CSU I-Corps on what you've learned from your interviews between webinars. This means you'll learn to get comfortable with public feedback. But we also know teams will learn from each other – a classic "win-win!" CSU I-Corps is not a competition; be respectful of the other teams, listen to what they are learning and think about how it might apply to your own learning.

SCHEDULE OF FALL 2017 ACTIVITIES

All webinars are held noon – 1:30 pm on Zoom (weblink above), unless otherwise noted!

Date / Instructor(s)	Activities & Milestones	Assignments / Homework (due before each webinar at noon Wednesday) & Deadlines
<p>Monday, Sept. 11</p> <p>Baxter</p>	<p>Webinar #1: Introduction to CSU I-Corps</p> <ul style="list-style-type: none"> • Team Roll Call & Introductions • I-Corps Philosophy • Syllabus Review • Using Google Drive Folders • Microgrant Administration • Homework Assignment 	<ul style="list-style-type: none"> • TALK: with your team and campus Research or Tech Transfer Office to learn about IP and ownership policies. • START READING: Talking to Humans https://s3.amazonaws.com/TalkingtoHumans/Talking+to+Humans.pdf
<p>Friday, Sept. 16</p> <p>Maloy & Pucher</p>	<p>Webinar #2: Problems Worth Solving and Evidence-based Entrepreneurship</p> <ul style="list-style-type: none"> • Team Roll Call • Homework Review & Feedback • Problems Worth Solving • Evidence-Based Entrepreneurship • Finding and Interviewing the Right Experts (LinkedIn exercise) • Homework Assignment 	<ul style="list-style-type: none"> • WATCH: Mir Imram Video (4:15 minutes): https://www.youtube.com/watch?v=ykrYzgj8QAO • WATCH: Elaine Chen video (17:58 minutes): https://www.youtube.com/watch?v=5FXEvdM-ek • READ: “Is Your Problem a Headache or a Migraine?” https://dkander.wordpress.com/2012/10/09/is-your-problem-a-headache-or-a-migraine/ • READ: “Funky Does Not Mean Easy to Use” http://www.ddstudio.com/critical-design-thinking-in-the-development-of-medical-devices-funky-does-not-mean-easy-to-use/ • DRAFT: Two or three sentences explaining, “What is the problem your team is solving?” Upload your answer to your Google Drive folder by Wednesday, Sept. 13 at noon.
<p>Friday, Sept. 29</p> <p>DeNoble & Pucher</p>	<p>Webinar #3: Value Proposition Design</p> <ul style="list-style-type: none"> • Team Roll Call • Homework Review & Feedback • Hypothesis Testing & Interviewing to Learn • Building Empathy – Who are your Customers/Users and What are their Pains/Gains/Jobs? • Homework Assignment 	<ul style="list-style-type: none"> • DRAFT: Your starting value proposition ad lib (use template!) • COMPLETE: “Elaborating Your Business Idea” Template • PLAN: Work with your Industry Mentor (IM) to identify 1-2 experts or early adopters to interview • MEMORIZE: Ground Rules for Interviewing (http://strategyr.s3.amazonaws.com/assets/vpd/resources/ground-rules-for-interviewing.pdf) • WATCH: Four “Before Leaving the Building” videos (~ 8 minutes) (https://venturewell.org/i-corps/llpvideos/customer-discovery/before-leaving-the-building/) • INTERVIEW: 1-2 industry experts or potential users/customers to test your understanding of customer/user needs (submit interview records to Google Drive, use template!)

Date / Instructor(s)	Activities & Milestones	Assignments / Homework (due before each webinar at noon Wednesday) & Deadlines
<p>Monday, Oct. 9</p> <p>Martindale</p>		<ul style="list-style-type: none"> • WATCH: University of Michigan Intellectual Property Videos (~ 40 minutes): #2 (Overview of Categories of Intellectual Property), #6 (What are patent rights?), # 11 (What is Prior Art?), #14 (Public Disclosure Issues), #15 (Patent Application Process), #21 (Patent Inventorship), #24 (Patent Ownership), #30 (Freedom to Operate), #37 (Copyright Overview) & #42 (Works for Hire) • COMPLETE: The Prior Art Exercise (DUE NOON, Oct. 9) - submit the most relevant 1-2 patent/patent applications, along with any intellectual property questions you would like the teaching team to address at the In-Person Meeting (Oct. 22), to the Google Drive
<p>Friday, Oct. 13</p> <p>Baxter</p>	<p>Webinar #4: Business Model Canvas</p> <ul style="list-style-type: none"> • Team Roll Call • Homework Review & Feedback • The Business Model Canvas • Mark-up Format to Track Changes in Thinking, Learned in Interviews • Value Proposition Design • Homework Assignment 	<ul style="list-style-type: none"> • WATCH: Steve Blank’s BMC video: http://steveblank.com/2014/06/23/keep-calm-and-test-the-hypothesis-2-minutes-to-see-why/ • READ: Pages 6-63 in <i>Value Proposition Design</i> • TEAMWORK: Complete a Value Map (see page 44-45 in <i>Value Proposition Design</i>) to generate hypotheses to test • INTERVIEW: 2-3 experts or potential users/customers (submit interview records to Google Drive, use template!)
<p>Sunday, Oct. 22</p> <p>At San Diego State University</p> <p>All</p>	<p>In Person Meeting: Putting it All Together</p> <ul style="list-style-type: none"> • Team Roll Call & Introductions • Intellectual Property Consults (Martindale) • Business Model Canvas Development • Multi-Sided Markets • Mock Interviews & Consults with Biotech Experts • Compelling Story Telling Using the BMC 	<ul style="list-style-type: none"> • WATCH: Customer Segments in the Life Sciences: https://vimeo.com/125172371 • READ: Pages 16-46 in <i>Business Model Generation</i> • TEAMWORK: Investigate and choose a free Business Model Canvas tool and start using it – transfer your top ideas from your Value Map to your BMC! (see Business Model Fiddle or Canvanizer – but you might find others!) • COMPLETE: your BMC v1 (in the process, you’re identifying new assumptions, guesses and hypotheses to test!) • INTERVIEW: 2-3 experts or potential users/customers (submit interview records to Google Drive, use template!)
<p>Friday, Oct. 27</p> <p>DeNoble & Baxter</p>	<p>Webinar #5: Pivots & Synthesis</p> <ul style="list-style-type: none"> • Team Roll Call • Homework Review & Feedback • Pivots & Kinds of Pivots • Synthesizing Interview Results into Patterns of Learning 	<ul style="list-style-type: none"> • READ: Top 10 Ways Entrepreneurs Pivot a Lean Startup (Martin Zwillling) https://www.forbes.com/sites/martinzwilling/2011/09/16/to-p-10-ways-entrepreneurs-pivot-a-lean-startup/#e774e2b2d2bd • WATCH: All 6 “Back in the Building” videos and Customer Segments in the Life Sciences (15 min.) https://venturewell.org/i-corps/lpvideos/customer-

Date / Instructor(s)	Activities & Milestones	Assignments / Homework (due before each webinar at noon Wednesday) & Deadlines
	<ul style="list-style-type: none"> Homework Assignment 	<p>discovery/back-in-the-building/</p> <ul style="list-style-type: none"> INTERVIEW: 1-2 experts or potential users/customers SUBMIT: BMC v2
<p>Friday, Nov. 17 Maloy & Baxter</p>	<p>Webinar #6: Telling the Story – Technology Videos and Lessons Learned Presentations</p>	<ul style="list-style-type: none"> INTERVIEW: 3-5 experts or potential users/customers SUBMIT: BMC v3 WATCH: David Reimer’s Series on Getting your Story Straight - https://venturewell.org/i-corps/llpvideos/david-riemer/
<p>Friday, Dec. 1 All</p>	<p>90-Second Tech and 3-minute Lessons Learned Videos Due</p>	<p>Two DIFFERENT Video Assignments:</p> <ul style="list-style-type: none"> FILM: 90-second video introducing team members, the research lab they work in, the science/engineering underneath the biotechnology concept (= Tech Video) FILM: 3-minute video describing Lessons Learned in CSU I-Corps so far. Tell a story about a memorable interview – be specific about who you interviewed (& when and where!) – and how it impacted your teams’ thinking about your commercialization path (= Lessons Learned Video) SUBMIT: Two videos (use self-explanatory, clear file names!) to Google Drive by 5pm on December 1st. Teaching team will provide feedback by December 15th so that you have time to learn more lessons before January 11!
<p>Wednesday, Jan. 10 (noon)</p>	<p>Lessons Learned Presentation Slidedeck and 90-second Tech Video Due</p>	<ul style="list-style-type: none"> CONTINUE INTERVIEWING during Independent Team Phase of CSU I-Corps for a total of 30-40 experts or potential users/customers. SUBMIT interview records to Google Drive as you interview (it’s the only way we can know you’re still hard at work)! KEEP ITERATING, but FINALIZE your Business Model Canvas by January 10 – it will be part of your final Lessons Learned presentation! Save all versions you create on Google Drive. Based on Feedback, IMPROVE, DEVELOP AND PRACTICE Final Tech Video (90-second) and Lessons Learned Presentation (10 minutes) for Evaluation Panels (Jan. 11-13, 2018, Santa Clara Marriott). Video files and slide decks must be available on Google Drive by NOON January 10th. You will not need a Lessons Learned video for the final weekend.
<p>Thursday, Jan. 11 At Santa Clara Marriott</p>	<p>Final Immersion Weekend:</p> <ul style="list-style-type: none"> Orientation Cohort Photo Preliminary Lessons Learned Presentations (Private) 	<ul style="list-style-type: none"> Upon arrival at the hotel, we will have a mandatory orientation to instruct teams on travel expense reimbursement, assign work rooms, and outline events for the weekend. From the orientation, your team will be sent directly into the preliminary presentations. Arrive at the orientation in business casual attire. Presentations will be made to experts (to be named) invited

Date / Instructor(s)	Activities & Milestones	Assignments / Homework (due before each webinar at noon Wednesday) & Deadlines
		to evaluate teams (not teaching team only!). Preliminary presentations are open to only CSU I-Corps teams and advisors.
Saturday, Jan. 13 At Santa Clara Marriott	Final Lessons Learned Presentations (Public)	<ul style="list-style-type: none"> • Presentations will be made to external experts (to be named) invited to evaluate teams (not teaching team!). Final Lessons Learned presentations are open to the public. Expect 200-400 people in the audience, mostly participants attending the 30th Annual CSU Biotechnology Symposium.
Wednesday, Jan. 31	Last Day to Spend on Microgrant	
Thursday, Feb. 1 – Feb. 12	Final Reporting	
Tuesday, Feb. 20	Go / No Go Decisions Communicated	



