National Science Foundation
Innovation Corps Program (I-Corps™)

Guidelines for NSF National I-Corps™ Team Preparation

Minimum Suggested Short Course Requirements

Version 1 May 22, 2016

Contents

Guidelines for NSF National I-Corps™ Team Preparation

Minimum Suggested Short Course Requirements

1. Executive Summary

One of the overall goals of I-Corps™ training at Sites (and Nodes at a regional level) is to enable and prepare more teams to qualify and succeed in the I-Corps™ National Program. This document sets forth best practices and a standardized curricular recommendation called the "short course" to assist Sites and Nodes in deploying content that will better prepare teams to qualify, compete and excel at the National I-Corps™ course.

The NSF does not require Sites or Nodes to conduct short course training in any standardized format. The short courses included in this document have been implemented across the National Innovation Network and demonstrated a high success rate at preparing teams for the national I-Corps™ program and in facilitating a team's transition into start-up formation or commercialization.

The intent of this document is not to dictate what I-Corps™ Sites or Nodes must do, but rather suggest the level of preparation a team should undergo in order to potentially qualify and succeed in the National I-Corps™ program (qualifications based on National Science Foundation (NSF), NSF 12-602). The NSF encourages Sites and Nodes to innovate around the training provided to teams. However, teams without a minimum level of preparation or those with experience in a duplicative program typically have not found a fit within the national I-Corps™ program.

2. Definitions

For the purposes of this document, the term "short course" will be used to define any I-Corps™ training program that is not the official National course. It is NOT a commentary on the recommended content or duration of any offering by Sites or Nodes.

3. Format of Short Courses

The format of a short course can be variable and open to Site and Node innovation in course delivery. The I-Corps™ program has seen a blend of virtual and physical programming or specialty that have all produced teams well prepared for the intensity and expectations of the national I-Corps™ course. In general, most successful team preparation courses deployed by Sites (or Nodes at a regional level), share the following elements:

- Most courses, that is, those focused primarily on National Team qualification and screening~~,~~ are conducted in a two or three week format to maintain intensity of engagement. However, a number of Sites have integrated the curriculum principles into semester long capstone courses, as stand-alone for-credit or not-for-credit courses, or outside of the traditional course format.
- While many program formats vary, successful courses engaged in at least two cycles of customer discovery and group feedback
- Courses should maintain a focus on in-person meetings and feedback.
- Courses should have multiple instructors involved who are familiar with the rigor of the National I-Corps™ course to provide teams with adequate feedback while providing an honest assessment of team readiness for national I-Corps™ programming.

Two versions of successfully deployed regional short course formats for course delivery are available as a resource for you in developing your own unique short course; there is a two-week version and a one-semester version included in the appendix. It is intended that Sites and Nodes should have the freedom to expand and contract course delivery to suit their situation and these examples are provided for context in future course development and deployment.

4. Teaching Team (Instructor) Composition

While the NSF does not mandate or review who conducts training in short course programs, it is strongly recommended that any short course offering be led or supported by trainers who come from one of the following sources:

- I-Corps™ Certified National Faculty who have completed National Train the Trainer Program
- Those who have served as Adjunct Faculty for the I-Corps™ National Program
- Those who have participated in the I-Corps™ National course on a team as either IM's, PI's or EL's previously.
- Faculty or Staff who have attended a LLP training course offered by VentureWell, one of the I-Corps™ Nodes, or one of the LLP Educator Programs.

5. Team to Teacher Ratio

Experiences at Sites and Nodes have found that a ratio of a maximum of 8-10 teams per instructor allows instructors in short courses to hold teams accountable to customer discovery requirements and to make an informed assessment of whether teams are at the appropriate stage of project development and prepared for the National I-Corps™ program.

6. Minimum/Maximum Lecture and Course Content Requirements

In general, Regional qualifying short courses should:

- Serve as an introduction to I-Corps™, and
- Not attempt to condense or duplicate all the material in the national seven-week course.

Whether programs are delivered in a short two-week training format or over a semester or longer, it is recommended that the following lectures/content, at minimum, be provided to teams prior to their transition from the short course to the national I-Corps™ application:

- Introduction to the Business Model Canvas
- Best Practices for Customer Discovery
- Value Propositions and Customer Segments

It is estimated that a minimum of six hours of classroom workshop time with teams (whether virtual or physical) is required to deploy this training. A variety of sample exercises for the workshops and other resources are available (see appendix). The important aspects to cover are:

1. **Introduction to the Business Model Canvas**
   An overview of the components of the canvas building blocks. A short course cannot dive deeply into all of the elements of the canvas. The most important to cover are: Customer Segments – who are the customers; Value Proposition – what customer needs are satisfied; Key Activities – what is done to deliver the Value Proposition; and Revenue Stream – how does the business generate its revenue.

2. ***Best Practices for Customer Discovery***
   A core component of any short course that will qualify a team for national I-Corps™ is that teams engage in active customer discovery efforts. Historically teams who engage in more customer discovery efforts are more successful in accurately assessing the actual commercial potential for their project. In order for teams to be prepared for national training at I-Corps™, it is strongly recommended that a team in short course program conducts between 20-50 (30 recommended) in person or Skype interviews over the duration of the short course. Teams that do not conduct at least 20 interviews may not be prepared for the rigor of the National I-Corps™ course. Those that complete more than 50 interviews may be hesitant in 'starting from zero' as is required in the National program. It is important to note that survey data does not count as interviews for the purposes of I-Corps™. Instructor review and assistance in interpretation of customer discovery findings is strongly recommended.

3. **Value Propositions and Customer Segments**
   Guidelines for identifying various types of customer segments should be covered as well as ways for capturing customer profiles, archetypes, and their pains and gains associated with the value propositions.

7. Lessons Learned and What's Next Session

In preparation for national I-Corps™, all short course participants should incorporate a "lessons learned" session. This is a short session where teams present their findings from interviews and how it impacted their business model canvas. The lessons learned session is a time for the teaching team delivering the course to assess how much effort the team has exerted in conducting customer discovery and a chance to make recommendations for National I-Corps™. In the lessons learned session instructors should be reviewing teams for the following:

- Customer Discovery Efforts (At Least 20, preferably 30 Interviews)
- Team Dynamics and Coach-ability
- Team Commitment to Project
- Openness to Pivoting
- Creativity in getting interviews

In addition, teams should be provided an overview of the national I-Corps™ course and the process for application to the course (See appendix). Teams should signal during the "What's Next" session whether they intend to pursue I-Corps™ at a national level.

8. Short Course Team Assessment and Evaluation

As with any class offering or course, teams should be evaluated objectively for learning and findings. While in many cases this is done in the context of a class, instructors at Sites and Nodes should be sure to carefully assess teams who are looking to move to the national I-Corps™ program for suitability to the program. As such, short course instructors are encouraged to engage in the following:

- Conduct Teaching team office hours individually with teams to obtain one on one assessment of team status and suitability for next steps.
- The instructors for the course should develop a ranking sheet tracking the team composition, number of interviews conducted by the team, next steps and whether the instructor team feels that the team is ready for the National I-Corps™ course. If a substitution for PI or IM is necessary, this should be noted.
- Teams should be tracked longitudinally to allow your Site or Node, and the NSF, to obtain long-term metrics for team success at a regional level.

9. Resources for Sites and Nodes in Course Development and Deployment

In an effort to support new and existing Sites and Nodes in developing effective National I-Corps™ qualifying courses, Venturewell is providing a number of resources to the greater National Innovation Network (NIN) community. These resources are grouped around the following broad topics:

Course Curricula:

- A database of national and regional course offerings by Sites and Nodes is available to all NIN members

Course Advisory and Support:

- New NIN elements are strongly encouraged to consult with longstanding Sites or Nodes to work on joint deployment of new short course formats. The NSF and VentureWell are willing to make introductions to appropriate resources in support of deployment of new course offerings
- Team qualification and application information can be found with National Science Foundation (NSF), NSF 12-602

Metrics Collection and Assessment:

- Venturewell has developed a template for cohort metric collection suitable for use by Sites and Nodes in the administration of I-Corps™ programming and can be made available upon request.

Site and Node Administration:

- Monthly NIN calls are being held to ensure that teams are able to share best practices in Site and Node administration. Best practices are captured and shared with elements of the NIN community.
- Node and Site administration guides have been developed by NSF and are available when requested
- New NIN elements are also strongly encouraged to consult with longstanding Sites or Nodes for best practices in administration.

Appendix 1: Short Course Example Two-Week Version[1]

The following represents an example syllabus and course schedule for a regional qualifying course, which allows teams to receive minimum course requirements and feedback while adequate time to conduct at least 30 interviews over a two week period. Notice the feedback loop session mid-cycle.

Course Schedule

Opening Workshop: Session 1, Week 1 Monday

Time	Session
9:00 – 9:15 am	**Registration/Coffee**
9:15 – 9:45 am	**Introduction to I-Corps™** • Teaching Team Introductions • Class Goals • Teaching Philosophy • Expectations of You • NSF National & Regional Programs
9:45 – 10:15 am	**Team Introductions** • 60 second introductions: team name & initial "business thesis" (who is your customer, what is your product, why would they buy it)
10:15 – 11:45 am	**Customer Discovery and Business Model Generation** • Business Model Canvas & Customer Discovery • Customer Segments, Sub-Segments, Types • Value Propositions • Problem-Solution, Product-Market, and Business Model Fit *Teams should be prepared to present their initial canvases if called upon*
11:45 am – 12:45 pm	**Lunch (provided)**
12:45 – 2:45 pm	**Workshop: Best Practices for Customer Discovery *** details below • Who should you interview • How to get, conduct, and record customer interviews • Practice (role play) interview exercises
2:45 – 4:15 pm	**Mandatory Office Hours** • Teams will be assigned 15-min time slots for a one-on-one meeting with an instructor Please plan to stay the whole time – network with other teams while not in an office hours session

[1] Adapted from the DC Node I-Corps Regional Qualifying Course

*Workshop Details (12:15 - 2:15pm)

12:45 – 1:15 pm	**Best Practices for Customer Discovery Lecture** • Who should you interview • How to get, conduct, and record customer interviews
1:15 - 2:00 pm	**Interview Exercise #1** • Details below
2:00 – 2:45 pm	**Interview Exercise #2** • Details below

Exercise #1

- Teams will be split into *two groups* (each room will have 4 or 6 teams, so groups of 2 or 3).
- Each room will have an instructor.
- All teams will take **5-minutes** to come up with "cold call questions/script" to get interview. Team must also identify role for interviewee to play in the exercise (i.e., type of customer).
- Each team in a group will take a turn "trying to get an interview" with the instructor/interviewee. The team should follow best practices as shown in the Customer Discovery Best Practices lecture. Instructor and observing teams will provide feedback to "interviewing team." This is ITERATIVE process…teams will start/stop multiple times as needed. **10-minutes per team (20-30 minutes per group, depending on room size).**

Exercise #2

- Teams will *split into pairs*.
- Teams will take **15-minutes** to create a list of questions for interviewees.
- Each team will take a turn "interviewing one another". Instructors will act as independent observers and provide feedback to interviewing teams – and will rotate among the team pairs. Focus will be on questions asked, not on responses of interviewees (who will be role playing and perhaps unfamiliar with real customer application). Will follow best practices as shown in main Customer Discovery lecture. This is ITERATIVE process…teams will start/stop multiple times as needed. **15-minutes per team, 30-minutes total.**
- Each room will take 45 minutes to complete this exercise.

Session 2, Week 1 Friday (Alternate Week 2 Monday)

Time	Session
1:00 – 1:15 pm	**Registration & Welcome**
1:15 – 1:30 pm	**Introduction & Refresher**
1:30 – 3:00 pm	**Team Presentations** • 10 minute presentations
3:00 – 4:30 pm	**Office Hours**

Session 3, Week 2 Friday

Time	Session
9:45 – 10:15 am	**Welcome Back & What's Next**
10:15 – 11:45 am	**Team Presentations** • 10 minute presentations / 5 minute teaching team comments
11:45 am – 12:45 pm	**Lunch**
12:45 – 2:15 pm	**Team Presentations** • 10 minute presentations / 5 minute teaching team comments
2:15 – 2:30 pm	**Closing Ceremony**
2:30 – 4:00 pm	**Optional Office Hours**

Appendix 2: Short Course Example One Semester Version[2]

The following is an example of how an I-Corps™ regional qualifying course can be deployed over the course of a 3-month period (or roughly a semester in length). There is a blend of virtual and physical meetings for the class and office hours. Office hours are times for one on one interaction with teams to assess progress and ensure that they are interpreting customer discovery findings adequately. Teams should have no difficulty in achieving at least 30 interviews during this cycle. This format provides and preserves space for specialty content each week. Some Sites and Nodes have incorporated technology or sector specific content in these sessions. The 3-month short course should not become a duplicative course to the national program if teams may have the goal to apply and participate in the National program.

SCHEDULE OF SPRING 2015 ACTIVITIES (AS EXAMPLE)

Date	**Activities, Deadlines and Milestones**
Saturday, Week 1	All-Day, In-Person Kickoff Meeting 10 am - 4 pm
Friday, Week 2	Office Hours, noon – 1pm
Friday, Week 3	Webinar/Physical Class #1 noon – 1pm Customer Interviewing, Synthesis & Pivot Sector Specific Content
Friday, Week 4	Office Hours, noon – 1pm
Friday, Week 5	Webinar/Physical Class #2 noon – 1pm Business Model Canvas Concepts Sector Specific Content
Friday, Week 6	Office Hours, noon – 1pm
Week 7	Flex Week to accommodate Holidays
Friday, Week 8	Office Hours, noon – 1pm
Friday, Week 9	Webinar/Physical Class #3 noon – 1pm Multi-Sided Markets & Regulatory Awareness Sector Specific Content

[2] Adapted from the CSU Site Course Offerings

Friday, Week 10	Office Hours, noon – 1pm
Friday, Week 11	Webinar/Physical Class #4 noon – 1pm Telling the Story with Final Presentations
Wednesday, Week 12	One-Page Summaries Due
Friday, Week 12	Office Hours, noon – 1pm
Friday, Week 12	Office Hours, noon – 1pm
Saturday, Week 13 (Finals)	Final Presentations & Evaluations 10 am – 3 pm

Semester Syllabus

All-Day, In-Person Kickoff Meeting, Saturday, Week 1, 9:30 am - 4 pm

Learning Outcomes for Kickoff Meeting:

1. Walk out of Class with a first draft Business Model Canvas
2. Walk out of Class with a IP-scrubbed elevator speech
3. Walk out of class with a hypothesis to test via ~ 5 (five) interviews (March 30 – April 9th)

Pre-class reading: Steve Blank's blog: http://steveblank.com/2010/10/25/entrepreneurship-as-a- science-%E2%80%93-the-business-modelcustomer-development-stack/

Pre-class videos to watch:
Steve Blank, Evidence-based Entrepreneurship (~25 minutes): https://www.youtube.com/watch?v=zjvEanpktEo

Watch University of Michigan Intellectual Property Videos: # 11 (What is Prior Art?), #14 (Public Disclosure Issues), #21 (Patent Inventorship), #24 (Patent Ownership), #30 (Freedom to Operate), #37 (Copyright Overview) & #42 (Works for Hire). See also University Tech Transfer (#26).

9:30 – 9:45 am: I-Corps™ Introduction

- Overview of Program Learning Objectives
- Logistics

9:45 – 11:15 am Business Model Canvas and Evidence-based Entrepreneurship

- Guest Speaker to Illustrate Real-Life Search for a Biotech Business Model

- Introduction to Lean LaunchPad Principles
- Introduction to the Business Model Canvas

11:15 am – 12:30 pm Customer Discovery and Interviews

- Discuss Evidence-based Learning
- Introduction to Customer Interviewing (VPN Companion: http://strategyzr.s3.amazonaws.com/assets/vpd/resources/ground-rules-for-interviewing.pdf)

Break & Working (Box) Lunch

1 - 2 pm: Protecting Intellectual Property During Customer Discovery

- How and what can you communicate about your biotechnology to customers, partners, others without compromising your IP position?

2 – 3pm: Customer Archetype Identification

- Technology Push vs. Pull
- Customer Profiles
- Pains, Gains, Jobs

3- 4 pm: Individual Team Consults on Intellectual Property / Technology Transfer

HOMEWORK for Webinar #1 (Week 2):

1) Read *Value Proposition Design* (free 100 pages)
2) Interview 5 potential customers to learn about pains, gains and their jobs

Week 3 Webinar: Customer Interviewing and Synthesis

- Team Reports on Lessons Learned
- Specialty Content

Week 5 Webinar: Business Model Canvas Concepts

- Team Reports on Lessons Learned
- Specialty Content

Week 8 Webinar: Multi-Sided Markets and Regulatory Awareness

- Team Reports on Lessons Learned
- Specialty Content

Week 10 Webinar: Telling the Story with Final Presenations

- Team Reports on Lessons Learned
- Specialty Content

All-Day, In-Person Final Meeting, Week 13

Learning Outcomes for Final Meeting:

1. Walk out of Class with a Business Model Canvas that could be used for NSF I-Corps™ Team application or SBIR commercialization plan, etc.
2. Walk out of Class with an external evaluation panel's assessment of team, technology andcommercialization plan maturity (this is what Teaching Team leans on for "go/no-go" decision for NSF)
3. Walk out of class with a "Next Steps" Plan ("go/no-go")

Appendix 3: Collection of Course Materials and Videos

A variety of materials have been collected to support the deployment of I-Corps™ courses in a variety of formats. It is up to the Sites and Nodes deploying courses to determine which materials are most valuable for their individual situation.

Helpful Course Textbooks and Downloads:

- ***Value Proposition and Design***
  - Alexander Osterwalder, Yves Pigneur, Greg Pernarda & Alan Smith
  - A free download of the first chapter of the book is available at https://strategyzer.com/value-proposition-design?_ga=1.152090042.2059273423.1389715841

- ***Talking to Humans***
  - Giff Constable
  - A free download of the book is available at http://www.talkingtohumans.com/

- ***Business Model Generation***
  - Alexander Osterwalder & Yves Pigneur
  - A free download of the first chapter of the book is available at http://businessmodelgeneration.com/book

- ***The Startup Owner's Manual***
  - Steve Blank & Bob Dorf
  - No download available

Helpful Course Video Links:

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

- University of Michigan I-Corps™ Node Intellectual Property Video Library:
  - http://ipvideos.engin.umich.edu/intellectual-property/all-videos/

Appendix 4: Team Formation and Technology FAQ's

Team Composition and Eligibility FAQ's:
Traditional I-Corps™ Teams at a National Level are comprised of the following team members as illustrated in the current NSF I-Corps™ Teams solicitation (http://www.nsf.gov/pubs/2012/nsf12602/nsf12602.htm).

Team roles:

- The Principal Investigator (**PI**) will be responsible for overall grant management should the team progress to the national NSF I-Corps™ program. The PI is typically a university faculty member who developed technology or innovation that will be taken through the I-Corps™ program. The PI should be someone who your institution will permit to be the submitter of and recipient of an NSF award should the team be successful in competing for the national program.
- The Entrepreneurial Lead (**EL**) could be a post-doctoral scholar, graduate, or other student with relevant knowledge of the technology and a deep commitment to investigating the commercial landscape surrounding the innovation. The Entrepreneurial Lead should also be both willing and able to support the transition of the technology, should the I-Corps™ project demonstrate the potential for commercial viability.
- The I-Corps™ Mentor (**IM**) will typically be an experienced or emerging entrepreneur who operates in proximity to the institution and who has relevant industry and/or startup experience to help the team navigate the customer ecosystem.

At a short course level, the most important member of a team is the EL. The EL enrolled in the short course should plan on remaining with the team through both the regional training as well as for the National I-Corps™ application. EL changes from regional to national is not encouraged and should be reviewed with cognizant I-Corps™ Sites PD at the NSF. In many cases teams at Sites or Nodes could have multiple EL's. It is possible that up to two (2) EL's may participate in the I-Corps™ National Course.

PI Role in Regional/Short Course Activities:

The PI in a national I-Corps™ cohort team ~~level~~ is usually a NSF funded researcher as defined in the existing NSF I-Corps™ Teams solicitation (http://www.nsf.gov/pubs/2012/nsf12602/nsf12602.htm) .
Those funded PIs are eligible to compete for the national program without having completed your regional program. However, traditional I-Corps™ eligible PI's are also encouraged to participate in regional or short course activities first. One of the goals however for short course programs at Sites or Nodes is to enable team qualification for PI's who do not qualify based on the classic definition. In regional and short course programming, while PI's are not required to be present, it is

strongly encouraged that each Sites or Regional Node team have a PI attached to the project in some capacity. In any case, a PI attached to a regional or Sites team should have the ability to be recognized by their institution as a Principal Investigator. As each institution's rules for granting PI status are different, it is strongly encouraged that each Site or Node become very familiar with the rules governing PI status within their institution.

In order to give Sites and Nodes flexibility in deploying their own custom programming, the PI role with the team is not directly defined. However, some example roles for PI's in short course or regional program formats include:

- Team Faculty Sponsor, acting as an official sponsor for the team, following them through the entire customer discovery process.
- Full Team Member, actively working with the team through all aspects of the program.
- Faculty Mentor for the team or teams.
- Others.

EL minimum qualifications:

- Must either be currently be enrolled, or have been graduated less than a year, at an institution of higher learning eligible for NSF Awards.
- Must have the time and ability to commit to I-Corps™ activities at both a regional and national level.
- Must have an in depth knowledge of the technical basis for the innovation or process that is the potential subject of the I-Corps™ project. Usually this is as a result of a direct working relationship with the lab (and resulting PI) which has developed the innovation.
- Must have the right to work on the innovation in the customer discovery process.

IM Role in Regional/Short Course Activities:

The Mentor role for I-Corps™ teams is very important. In many cases the I-Corps™ Mentors (IM) will provide key insights to the team and focus largely on supporting the EL in conducting and interpreting customer discovery efforts. From a standard or short course perspective the presence of the IM throughout the entire process is not required although teams are known to benefit from the presence of experienced advisors throughout the customer discovery process. In practice the IM may be changed based upon team needs and the IM may change as the team transitions from short course to national I-Corps™.

Technology Suitability FAQ's

In keeping with the NSF mandate for I-Corps™ Teams, Sites, and Nodes, all I-Corps™ technologies should focus on Science, Technology, Engineering, or Mathematics (STEM) as defined by the NSF. As demonstrated by NSF's portfolio of awards, there is very broad interpretation within these fields. However, I-Corps™ cannot fund topics that would normally be funded by the National Institutes of Health, that is, purely medical sciences.

In order to preserve the ability for teams to successfully engage in customer discovery, teams who have a technology focused business concept should have the ability to freely engage in customer discovery. Usually this means the following:

- The technology that is the focus of the I-Corps™ program is not encumbered in any way by:
  - A licensing agreement
  - A private sponsored research agreement
- While customer discovery does not focus on proprietary technical data, and as such should not result in a public disclosure event, teams engaged in customer discovery should be working with technology topics that:
  - Have had an invention disclosure filed at their university
  - Have the ability to engage in an option or license agreement with their institution in the future if a start up is developed from either the short course or national I-Corps™ course.