

FSE 598 - Special Topics Technology Commercialization

Ira A. Fulton Schools of Engineering | Arizona State University

Credits	3 credit hours
Learning Modality	Internet Hybrid In-person meetings: most Tuesday evenings (time TBA), approx. 90 minutes
Term	Fall C 2026; August 25 - December 1, 2026
Location	Internet Hybrid ASU Tempe Campus
Instructor	Patricia Rubio rrubioso@asu.edu
Course Coordinator	Dr. Brent Sebold bsebold@asu.edu
Pre/Co-Requisite	NSF I-Corps Hub Aspire 4-Week Program (recommended)
Part of	Graduate Micro Certificate: Fundamentals of Engineering Entrepreneurship and Innovation

Course Description

This course prepares graduate students to commercialize technology and intellectual property through evidence-based customer discovery. Grounded in the NSF I-Corps methodology, Lean Startup principles, and the full Business Model Canvas framework, students will identify customer segments, formulate and test hypotheses, conduct real-world discovery interviews, map complex stakeholder ecosystems, and synthesize findings into a compelling commercialization case.

Students complete a minimum of 48 customer discovery interviews across three iterative phases, culminating in a final evidence-informed Business Model Canvas and a commercialization recommendation. Students who complete this course with a validated hypothesis and strong interview log are well-positioned to apply to the NSF I-Corps National Program or pursue SBIR/STTR funding.

Pre-Course Preparation (Before Week 1)

Before the first class on August 25, please watch the following two short videos. This is required, not optional. Class time will not be used to cover this foundational material.

Required Viewing Before Week 1 (approx. 25 minutes total)

1. 'Before Leaving the Building' (~8 min) - VentureWell I-Corps Learning Library
Available at: <https://venturewell.org/i-corps/llpvideos/>
2. 'Outside the Building: Rules of Customer Interviews' (~12 min) - VentureWell
Available at: <https://venturewell.org/i-corps/llpvideos/>

Come to Week 1 ready to discuss: why customer interviews are different from surveys or focus groups.

Also prepare before Week 1:

- Draft a one-sentence business thesis: Who is your customer? What is your product or service? Why would a customer buy it? This becomes Slide 1 of your first presentation.
- Write down the names and job titles of the first 5 people you plan to interview. These must be real, reachable individuals - not generic categories like 'hospital administrators.'

Learning Outcomes

By the end of this course, students will be able to:

- Understand the principles of intellectual property commercialization
- Map customer job workflows, ecosystems, and stakeholder types: buyers, recommenders, influencers, and saboteurs
- Formulate and test key assumptions related to problem-solution fit and product-market fit
- Network effectively and secure interviews with target customers and stakeholders
- Conduct rigorous customer discovery interviews using open-ended questioning techniques
- Synthesize and present key insights from discovery using a structured narrative framework
- Complete and iterate on a full Business Model Canvas grounded in customer evidence
- Make a reasoned pivot-or-persevere decision supported by interview evidence
- Identify local and national resources available to support IP commercialization

Course Structure: Three Phases

The course is organized into three progressive phases. Each phase ends with a synthesis presentation and a customer interview checkpoint. Students work on individual lab-based ventures throughout the semester.

Phase	Focus	Interview Checkpoint
Phase 1 - Foundations (Weeks 1-5)	Customer segments, value propositions, hypothesis framework, right side of BMC, securing first interviews	10 interviews completed by Week 5
Phase 2 - Depth (Weeks 6-10)	Ecosystem mapping, jobs to be done, decision criteria, left side of BMC, hypothesis iteration	25 interviews cumulative by Week 10
Phase 3 - Business Model (Weeks 11-15)	Revenue streams, cost structure, channels, full BMC, commercialization pathways, pivot-or-persevere decision	48 interviews cumulative by Week 14

Case Studies

Each phase includes two case studies to illustrate the cost of skipping customer discovery - and the payoff of doing it rigorously. Materials will be posted on Canvas the week before each session.

Phase	Case Study	Week	Core Lesson
Phase 1	Quibi	Week 1	No market need: \$1.75B raised and spent without validated customer insight. Mobile short-form content existed, but not because customers could not find it on YouTube.
Phase 1	Segway	Week 2	Solution-first thinking: A revolutionary technology with no clear problem it solved better than existing alternatives. Confidence in the product replaced curiosity about the customer.
Phase 2	Theranos	Week 7	Avoiding scrutiny: When you stop talking to customers, experts, and partners, you lose the signal that would correct your assumptions. Ecosystem trust is not optional.
Phase 2	Better Place	Week 8	Wrong ecosystem map: Battery-swapping for EVs was technically sound but required alignment from car manufacturers, governments, and drivers simultaneously. None were.
Phase 3	Slack	Week 11	Pivot to product-market fit: Built as an internal tool for a gaming startup, the team discovered the real customer job was team communication. The insight drove everything.
Phase 3	Moderna mRNA	Week 13	Lab-to-market pathway: Decades of research, SBIR grants, licensing agreements, and BARDA partnership. A real-world model of how deep tech commercialization unfolds.

Grading

Component	Weight
Class Participation & Attendance	10%
Weekly Reflection Posts (Weeks 2-14)	10%
Business Model Canvas - Draft, Right Side (Week 3)	5%
Business Model Canvas - Full Canvas Updated (Week 12)	10%
Hypothesis Framework Submissions x2 (Weeks 4 & 8)	10%
Customer Interview Log (48 minimum, checkpoints at Weeks 5, 10, 14)	20%
Synthesis Presentations x3 (Weeks 6, 10, 14)	20%
Final Presentation & BMC Report (Week 15)	15%
Total	100%

Assignment Overviews

Weekly Reflection Posts (Weeks 2-14)

Short written posts (200-300 words) submitted on Canvas before each class. Students summarize what they learned, what surprised them from interviews or course content, and what questions remain open. Graded on completion and intellectual honesty - not polish.

Business Model Canvas - Draft, Right Side (Week 3)

Students submit their first BMC focusing on customer segments, value propositions, channels, customer relationships, and revenue streams as initial hypotheses only. This is a living document that will be updated and annotated throughout the semester as evidence accumulates.

Hypothesis Framework Submissions (Weeks 4 & 8)

Using the structure: 'We believe [specific target audience] experiences [specific problem] because [assumed reason], which leads to [negative impact]' - students submit two formal hypothesis documents, each with five or more open-ended interview questions designed to test that hypothesis. Technology must not appear in the hypothesis. The hypothesis must be about the customer's problem, not your solution.

Customer Interview Log (48 minimum)

Students must complete a minimum of 48 individual customer discovery interviews over the semester. Each log entry must include: the interviewee's job title and organization, the date and format (in-person or virtual), the top 3 insights from the conversation, and the hypothesis status after this interview (validated / invalidated / still testing).

Friends, family, and teammates do not qualify. Logs are reviewed at three checkpoints: Week 5 (10 interviews), Week 10 (25 interviews), and Week 14 (48 interviews). The interviewee should do 90% of the talking.

Synthesis Presentations x3 (Weeks 6, 10, 14)

Three individual presentations of approximately 7 minutes each (5 minutes presenting, 2 minutes instructor feedback). Each presentation must follow the four-slide structure below.

Required Slide Structure - All Three Synthesis Presentations

Slide 1 - Standard Title Slide:

Venture name, your name, photo or diagram of the technology, one-sentence business thesis, interview count since last presentation, and cumulative total.

Slide 2 - Updated Business Model Canvas:

Show changes from your previous version. Call out what changed and why. Annotate directly on the canvas.

Slide 3 - Discovery Narrative (use this exact four-part structure):

- What we hypothesized...(this is what we thought)
- What we did (method of testing, who we talked to, how we found them)...
- What we learned (insights, patterns, surprises - not just data points)...
- What we are doing next (pivots, new hypotheses, next 10 interviews)...

Slide 4 - Next Interview Plan:

Who specifically will you talk to before the next checkpoint? Name, title, organization, and which hypothesis each interview is testing.

Presentation #3 (Week 14) must also include a preliminary pivot-or-persevere statement with supporting evidence from interviews.

Business Model Canvas - Full Canvas Updated (Week 12)

A completed, evidence-informed Business Model Canvas covering all nine components. Each block must be annotated with: original hypothesis, what interviews revealed, and what changed. The quality and honesty of the evidence - not the elegance of the business model - is what is being evaluated.

Final Presentation & BMC Report (Week 15)

A 10-minute final presentation covering the full commercialization journey, accompanied by a written report of 3-5 pages. Both must address:

- Original assumptions and business thesis
- Customer discovery process: how interviews were conducted and who was interviewed
- Key pivots and the evidence that drove them
- Final Business Model Canvas with annotated evidence for every block
- Pivot-or-persevere recommendation with supporting rationale
- Recommended next steps: I-Corps Nationals, SBIR/STTR, licensing, or other pathway

Meeting & Deliverable Schedule

Week	Due Date	Phase	Topic	Case Study / Reading	Deliverable Due
Week 0	8/23/2026	Prep	Watch: VentureWell 'Before Leaving the Building' + 'Rules of Customer Interviews'		Video prep (~25 min)
Week 1	8/30/2026	Phase 1	Course Launch: Why Startups Fail & The Commercialization Mindset	Case Study: Quibi	Business thesis draft
Week 2	9/6/2026	Phase 1	IP Commercialization Fundamentals; Intro to the Business Model Canvas	Case Study: Segway	Reflection #1
Week 3	9/13/2026	Phase 1	Right Side of BMC: Customer Segments, Value Propositions, B2B vs B2C, Personas		BMC Draft (Right Side)
Week 4	9/20/2026	Phase 1	Hypothesis Framework; Pain Killers vs Gain Creators; Jobs to Be Done intro	Reading: Steve Blank HBR	Hypothesis #1
Week 5	9/27/2026	Phase 1	Customer Discovery: Securing Interviews, Cold Outreach Workshop		Reflection #4 + 10 interviews

Week	Due Date	Phase	Topic	Case Study / Reading	Deliverable Due
Week 6	10/4/2026	Phase 2	Synthesis Presentation #1: What we thought, did, learned, and what's next		Presentation #1 (10 interviews)
Week 7	10/11/2026	Phase 2	Ecosystem Mapping: Buyers, Influencers, Recommenders, Saboteurs	Case Study: Theranos	Ecosystem Diagram Draft
Week 8	10/18/2026	Phase 2	Jobs to Be Done Deep Dive; Decision Criteria; Magnitude of Pain vs Gain	Case Study: Better Place	Hypothesis #2 (revised)
Week 9	10/25/2026	Phase 2	Left Side of BMC: Key Activities, Key Resources, Key Partners		Reflection #8
Week 10	11/1/2026	Phase 2	Synthesis Presentation #2: Pivots, updated ecosystem, updated hypotheses		Presentation #2 (25 interviews)
Week 11	11/8/2026	Phase 3	Bottom of BMC: Revenue Streams, Cost Structure; Deep Tech Pricing Models	Case Study: Slack	Reflection #10
Week 12	11/15/2026	Phase 3	Channels and Customer Relationships; Route-to-Market for Lab-Based Ventures		BMC Updated (Full Canvas)
Week 13	11/22/2026	Phase 3	Commercialization Pathways: I-Corps Nationals, SBIR/STTR, IP Licensing, ASU Resources	Case Study: Moderna mRNA	Reflection #12
Week 14	11/29/2026	Phase 3	Synthesis Presentation #3: Evidence, pivots, full BMC, pivot-or-persevere		Presentation #3 (48 interviews)
Week 15	12/6/2026	Phase 3	Final Presentations: Full Commercialization Case		Final Presentation + BMC Report

A Note on Customer Interviews

The purpose of 48 interviews is not to confirm what you already believe.

It is to systematically challenge your assumptions until you find genuine evidence of a problem worth solving - or discover that your hypothesis was wrong. Both outcomes are equally valid.

You will be expected to approach each interview with documented open-ended questions, a willingness to be wrong, and the discipline to listen rather than pitch. The interviewee should do 90% of the talking. Engineers who fall in love with their solution before validating the problem consistently produce the weakest customer discovery.

If your first hypothesis survives 48 interviews completely unchanged, you almost certainly were not asking hard enough questions.

Commercialization Resources

Students who complete this course with a validated problem-solution hypothesis and a complete interview log are strong candidates for the following programs. These will be covered in detail during Week 13.

Program / Resource	Description
NSF I-Corps National Program	7-week federally funded program requiring 100 interviews. Comes with a \$50,000 grant for customer discovery. Students with 48+ interviews and a clear hypothesis are strong candidates.
SBIR / STTR Funding	Federal small business grants for research with commercial potential. Phase I awards up to \$275,000. Requires evidence of market need and a viable commercialization plan.
ASU Skysong Innovations	ASU's technology transfer and IP licensing office. Works with faculty and students to license university-owned intellectual property to industry partners.
Innovation to Market Program	ASU's internal technology commercialization accelerator. Provides mentorship, funding connections, and structured market validation support.
Venture Devils / Tech Devils	ASU startup programs offering funding competitions, co-founder matching, and networking through the Entrepreneurship + Innovation ecosystem.

Academic Integrity

All customer interviews must be conducted with real individuals outside your immediate personal network. Each log entry must contain enough verifiable detail to confirm authenticity: name, title, organization, date, and format. Fabricated or recycled interviews will result in a failing grade for the assignment and may be referred to ASU's academic integrity process.

The BMC annotations and presentation narratives must reflect your actual findings - not the findings you wished you had. Intellectual honesty is not only an academic requirement in this course. It is the entire point of the methodology.