What if fresh-from-the-lab technologies were like raw superpowers – and your job was to find out how to evolve them to solve real world problems? You'll work with peers from across the institute on actual technologies from MIT Labs in a multi-discipline team. We care about exploring a path to meaningful impact for MIT's deep tech together.

In the past decade, students like you have shepherded over 170 MIT technologies to impact via iT Teams and applied the same skills repeatedly to their own innovating adventures.

**HOW iT Teams IS DIFFERENT**

Typically, entrepreneurship or innovation classes ask you to start by imagining a product to learn the craft of pitching an opportunity. We don’t. In iT Teams, *everything is a variable.*

We’ll show you how to explore several possible “destinations” at once and help you resist the urge to productize every observation so you can explore a larger objective: taking a technology from lab to society to solve a meaningful problem is a significant scale-up endeavor, were you to engage in such endeavor you’d do well to plan to fail ONLY in ways that could not have been easily predicted. It’s up to you to make failure come as a surprise.

**CLASS GOALS AND EXPECTATIONS**

Our goal is to equip you with life-long skills required to *tame* real world problems. Specifically, you’ll *learn* how to scale up an idea out of your head all the way up to impact; and will learn how to communicate meaningfully across disciplinary divides to push an innovating agenda. These are skills you can practice and get better at over time.

We do so by reproducing real-world innovating conditions. If we succeed, next time you engage in an innovation or entrepreneurship it will feel like déjà-vu.

iT Teams alumni have used these skills in myriad ways after completing the course: Some have teamed up with the Labs in their efforts to form companies, further shape commercialization, and participate in several MIT competitions and extra-curricular activities. Companies created after iT Teams include LiquiGlide, Lantos, Manus Biotechnology, Viznu, Eta devices, Arctic Sand, Myomo, C2sense, Pipeguard Robotics, … and several ongoing “proto startups”.

Others have used what they learned to find another technology to start a venture; many have gone on to use the skills they acquired in the class to

- found startups of their own or participate in early-stage technology ventures
- pursue scientific careers in academia or industry
- enter venture capital
- join venture creation labs
- or innovate within established companies.

The iT Teams experience is valuable across many career paths: finance, business, policy, social impact, science, engineering, and beyond.

You’ll learn the skills working with a team on an MIT technology. The goal of the lab is twofold: help us make this educational experience possible, and learn what you discover about the opportunities for impact ahead of their discoveries. Their technology offers you a tangible starting point for your exploration of impact and real-world problem-solving.
STRUCTURE

PROJECT AND TEAM FORMATION
In the 3rd session you’ll hear labs present the technologies available this semester. We’ll help you come ready to ask away and interact with lab members. After the event, you’ll have to declare your project preferences. We will form teams the next day based on your preferences, feedback from the labs, and our commitment to offer you a cross-discipline experience.

Approach the project with a mix of enthusiasm, skepticism, and spirit of inquiry (rather than advocates or consultants); much like you would if you cared to know whether to spend your resources on this, or repeat the process with your own ideas. iTechs puts to test some deeply-held beliefs about entrepreneurship and innovation and will show you a different way to use skills and knowledge you acquire in your disciplinary training.

MEETING TIMES
A typical week:
- Tuesdays and Thursdays: lecture and class discussion. We’ll often use one of your projects as an example.
- Fridays: lab time. You’ll advance project work via in-class presentations, team time, and 1-on-1 coaching.

Why a Lab on Friday? MIT is a busy place. Your peers and alumni overwhelmingly agree that scheduling meetings is the main obstacle to team progress. We solved it: reserved team time is part of the class.

READINGS
Throughout the semester we’ll supply you with various links to readings, lecture notes and handouts.
Recommended reading:


COMMUNICATION AMONG TEAMS AND FACULTY
Slack ([slack.com](http://slack.com)) solves the e-mail-overload problem. Slack is for team interaction, after-class discussion, and inquiries to faculty. Touch base at least once a week. Here’s how:
- **Mud-cards**: have a question upon reflection after class? please ask! use the #mud-card channel or direct message @lpbreva.
- **Team Assessments**: A weekly outline (<200 words) of the evolving family of problems you believe your technology addresses (e.g. 2+ distinct opportunities, key “burning questions”). This helps your progress and helps us help you.
- **General interest**: often we’ll share news clippings and others that are relevant for the class. We welcome you to do the same and to engage in civil conversation to see how the skills you acquire apply beyond class projects.

We commit to answer every inquiry done through Slack in under two days. Use of Slack counts toward your participation grade.

PRESENTATIONS
iTechs presentations are to audiences ready to give feedback. The presentations are not for pitch practice.
- **“Being Wrong” Presentation**: This is your first opportunity as a team to explore the readiness (or lack thereof) of the technology with which you are working. Audience: peers and one guest.
- **Mid-Term Evaluation**: 2 minutes PowerPoint overview backed by evidence of three distinct opportunities for your project, followed by interaction with guests. Audience: select group of iTechs “friends” (e.g. innovators, VCs, entrepreneurs, alumni, and domain experts).
- **Mingling Event Presentation**: 2-minute PowerPoint overview of the final report followed by 1-on-1 discussion with guests. Presentations ought to include 3 distinct opportunities and clear steps to reduce uncertainty. This is the last opportunity to gather information about the space of opportunity from members in an audience.
ASSIGNMENTS
Assignments are designed for you to practice skills and progress in your project. Specific assignment instructions will be shared after team formation.
Weekly individual assignment: assessment of the problem you think your team is set out to solve, in under 500 characters. Instructions will be shared after team formation.

FINAL DELIVERABLES
- **Final Report**: 5 to 10 page written report that establishes a robust space of opportunity made possible by the technology you chose to work on. The report distils all your findings into a recommendation for the immediate next steps and medium/long-term milestones. It will be given to the course faculty and the PI. The report should document:
  - 3 distinct opportunities that may be seized with adequate evolution of technology and market understanding;
  - Paths to impact at scale: Map of decisions/uncertainties that chart options to evolve your project to several distinct and impactful destinations;
  - Next steps: A collection of actions required to verify what needs to be true along each path;
  - Considerations about the “vehicle” suited to act on those next steps (which requires you to consider funding, research and development needs, organizational elements, and value creation strategies to name some).
- **Final 1-on-1 Presentation**: 30 minutes overview of project outcomes and your recommendation in a discussion with the class faculty and 2-3 select guests.
  *It is entirely acceptable for your team to come to a well-researched conclusion that no avenue to impact for the technology exists.*

GRADING
- Team assignments – 15%
- Individual Assignments – 15%
- Presentations – 15%
- Team final report and one-on-one presentation (30%)
- Class and Slack participation (15%)
- Performance reviews from team members, PI, and Catalyst (10%)

ATTENDANCE
Attendance to all classes and labs is the best way to obtain 1-on-1 specific guidance from course staff. Absences will have a significant effect on your grade. We expect you to let us know in advance if an unavoidable conflict prevents you from attending a lecture.

DIGITAL DEVICES
Use of laptops or other digital devices is not permitted during class time.
PLAN

PHASE 1 – Understanding the nature of innovating and Team build-out.

Week 1 – Intro to class, Innovating as a skill, technologies as superpowers
T2/6 Lecture 1: iTeams overview, enacting the process of innovation
R2/8 Lecture 2: What’s a technology? How do you select one?
F2/9 No Lab, no formal in-class meeting, individual assignment

Week 2 – What’s a technology? What’s a problem? Selecting technologies, Forming teams
T2/13 Lecture 3: Project presentations by labs.
R2/15 Lecture 4: What’s a real problem? (appraising the end-point for iTeams)
F2/16 Lab 1: Team-work mechanics and team kick-off

PHASE 2 – Exploring for opportunities: the power of near misses.

Week 3 – Scoping the Technology/Functional space you got to work with
T2/20 MIT MONDAY. No-Class
R2/22 Lecture 5: Establishing what your technology can do. Practicing being wrong. (new concept: near-misses)
F2/23 Lab 2: Collective exercise and In class Team Time
Team milestones: work on assignment 3, must have met with Lab members

Week 4 – People and Parts. Being productively wrong
T2/27 Lecture 6: Making sense of people and use: Differentiating between Data, Evidence, Numbers, Guesses, and Biases. (new concept: differential analysis)
R3/1 Lecture 7: Use scenarios in-class practice
F3/2 Lab 3: “Being Wrong” presentations. Special Guest: TBA

Week 5 – Scalable “market”/“Community” exploration
T3/6 Lecture 8: Conceiving Market itineraries (new concepts: proof and adjacency)
R3/8 Lecture 9: In class practice how to conceive market itineraries working backwards from the organization you imagine
Practice-sheet handout: 50 years from now – Market working backwards (adjacencies and proof)
F3/9 Lab 4: Team Time. Team milestones: Practice working backwards from organization, talked with 5 people outside MIT.

Week 6 – Outlining parts for an organization
T3/13 Lecture 10: Triangulating Value and scaling back down. Which technologies do you actually need?
R3/15 Lecture 11: In class practice: outlining the boundaries of what you do.
F3/16 Lab 5: Collective exercise. Interactive case study of a real-life technology startup example through the iTeams lens. Team Milestone: finish assignment 5, Come ready to discuss 3 distinct opportunities
### Week 7 – *Sloan Innovation Period*

**T3/20**  
Lecture 12: TBA  
Assignment 5 Due: **Mapping out Value Chain and Imagined organization.**

**R3/22**  
Lecture 13: TBA

**F3/23**  
Lab 6: TBA

### Week 8 – *Spring Vacation*

**T3/27**  

**R3/29**  

**F3/30**  

### Week 9 – *Practice outlining three distinct opportunities*

**T4/3**  
Lecture 14: The Exploration method at a glance. Class discussion: how to present an opportunity.  
Assignment 6 Due: Outline of 3 distinct opportunities and Interview Chart and Data Review (report on your contact log and “leads” list).

**R4/5**  
Lecture 15: In class discussion, past midterm examples, burning questions, uncertainties.  
Practice Sheet Handout: *A utilitarian view of IP*

**F4/6**  
Lab 7: Midterm presentations. With several guests of honor.  
**Team time** Team Milestone: start to explore IP landscape and work on assignment 7

### PHASE 3 – Innovating as Scaling-up. Developing a “logical” vehicle to explore opportunity space.

### Week 10 – *The Logic of Scale*

**T4/10**  
Lecture 16: Midterm feedback and primer on how to Build an Experimental Logic for your Project (Understanding the meaning of Scaling Up)  
Practice Sheet Handout: Scale-up logic  
Assignment 7 Due: **Exploration (What if) Map – Rationalizing applications for scale**

**R4/12**  
Lecture 17: In-class practice. Scale-up logic exercise

**F4/13**  
Lab 8: Opportunity to Meet with our Catalyst, George Gong. Work on Assignment 8

### Week 11 – *The actions of Scale*

**T4/17**  
**INSTITUTE HOLIDAY (Patriots Day)**

**R4/19**  
Lecture 18: Scale-up iTeams Example. Team mixing to help each other with burning questions. *(Hosted by Jonathan Miller)*  
Assignment 8 Due: **Utilitarian IP landscape**

**F4/20**  
Lab 9: Opportunity to Meet with our Catalyst, George Gong. Team Milestone: Work on Assignment 9

**Week 12 – Connecting scale-up actions with evidence and impact**

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<td>Assignment 9 Due: How much? Resource assessment and prioritizing next steps for value creation/capture.</td>
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<td>R4/26</td>
<td>Lecture 20: Charting/appraising a space of opportunity with examples, and a utilitarian view of IP.</td>
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<td>F4/27</td>
<td>Lab 10: Team Milestone; prepare mingling presentation</td>
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**Week 13 – Presenting an opportunity. opportunity to practice info gathering in casual conversations.**

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<tr>
<td>T5/1</td>
<td>Lecture 21: “Mingling” event with our guests. Practice sharing information about opportunity space</td>
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<tr>
<td>R5/3</td>
<td>Lecture 22: Guest Lecture by our Catalyst, George Gong, regarding Perspective on Scale</td>
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<td>F5/4</td>
<td>Lab 11: Assignment 10 Due: Opportunity Map and Strategy (note this is a summary of your recommendation)</td>
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**Week 14 – Understanding what goes into a recommendation, Crafting good next steps**

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<tr>
<td>T5/8</td>
<td>Lecture 23: Going from 0 to 100,000+ units sold starting with a hunch (featuring our Catalyst, Harry Schechter of TempAlert)</td>
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<td>R5/10</td>
<td>Lecture 24: Preparing a recommendation.</td>
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<td>F5/11</td>
<td>Lab 12: Team time Team milestone: prepare final 1-on-1s</td>
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**Week 15 – Finals Week and the skills you learned, in hindsight.**

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<tr>
<td>T5/15</td>
<td>Lecture 25: Final 1-on-1s</td>
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<td>Final Report due date to be announced.</td>
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INTELLECTUAL PROPERTY NOTICE

The goal of the class is education. As a consequence of your educational endeavors, commercial activities might arise from your work. You will be working with groups that may be filing patents or otherwise involved with confidential information, intellectual property, and product development. The MIT Technology Licensing Office oversees any questions on these matters, and wants to stimulate the transfer of MIT technologies for the benefit of society.

Below are guidelines to consider when you participate in iTeams.

CONFIDENTIALITY
You may come in contact with confidential information. The faculty PI (or others on the team) may tell you which information is confidential. Treating such information with care is vital to securing the intellectual property rights to the technology. Be aware of how you propagate confidential information when talking to potential customers or market experts. We generally advise against signing NDAs for participation in MIT classes. However, in the past we have brought projects from outside MIT, and the organization proposing the project has suggested signing an NDA. That's unusual. Please do not pick a project with an NDA requirement if you are uncomfortable with this.

NO PUBLIC DISCLOSURE
Discussions in an MIT classroom or other MIT setting (with teammates and faculty) do not constitute a “public disclosure.” However, presentations where the public is invited or present must not include confidential information. As a rule of thumb, communications about a project that meet the following three criteria do not constitute a public disclosure: the communication fulfills a purpose for the project, the receiver of the information is aware of the sensitive nature of the information, you know who are all the people that received the information. When conducting interviews you will rarely need to share sensitive information (the best interviewers never feel the need to do so!). In case of doubt, check with your PI or their TLO officer.

ASSIGNMENT OF INVENTIONS
While you are working with the team, intellectual property (copyrights, inventions, trademarks, etc) may be developed. Ownership of intellectual property is governed by MIT policy. If the research leading to an invention was supported by sponsored research funding or made significant use of MIT facilities and/or MIT-administered funds, then MIT owns the intellectual property.

NO IMPLIED ELIGIBILITY FOR COMPENSATION OR EQUITY PARTICIPATION
Serving on an iTeam does not entitle you to get paid by or own stock in any company that might be created as a result of your work. There is nothing to prevent you from later seeking employment with the company; at that point, you may be compensated by the company for future work (but not your iTTeams work). If MIT licenses a patent or copyright on which you are an inventor/author, you are entitled to receive a portion of the royalty and/or equity MIT receives from the licensee in accordance with MIT’s royalty distribution policy.

COPYRIGHT OF WORK-PRODUCT PRODUCED DURING CLASS
You and your team have the right to own the copyright of various reports that you might author as part of your iTTeams work. This material will be shared with the PI and LL. You also grant to MIT the right to distribute this copyrighted material within the academic community. You acknowledge that there may be good reason to not distribute this material. If your report discusses MIT-owned, non-publicly disclosed intellectual property, you agree to seek MIT’s permission before distributing the report or otherwise disclosing the information.
CONSIDERATIONS about the end-point of your iTeams project

iTeams projects starts with your choice of a technology and conclude with your reporting on clear and actionable next steps for an organization that solves a real-world problem. You’ll report on a space ripe with opportunities for impact and in which the knowledge from the lab you worked with offers a provable and unfair advantage – including the steps necessary to seize that advantage. Good next steps do not arbitrarily restrict scope to one application, rather decrease uncertainty and increase value.

The end-point of iTeams is very different from that of most courses on entrepreneurship and innovation – most ask you for strategies for “technology push” or “market pull”, “elevator pitches,” strategic frameworks, business plans, design, or product marketing, to name some. Our end-point is sufficiently different to warrant some explanation.

Is the technology ready? Late? Early?

In short, none of the above. It could take as little as 1 year to get any of these technologies to become the basis for a new organization. Evolving a technology to have a positive impact in society you’ll need to venture beyond the technology you see now. That’s a high uncertainty and data scarce endeavor that will require you discover ways to get to evidence of potential impact in a space that is yet unexplored.

Why don’t we just pick an application from the start and do market analysis?

You could, then you’d no longer be working on the technology the lab has to offer but on a product-guess you imagined. If your guess is wrong that process does not scale very well. In iTeams everything is a variable. Expect your inquiry to modify the technology specifications, the target audience, the market and the ultimate goal (startup, more research, license,…) numerous times. The more you engage in active exploration the easier and better it gets.

You’ll find yourself using the toolkits of intellectual property, finance, entrepreneurship, technology development, strategy, management, and entrepreneurial marketing a bit differently than you may be accustomed to. You’ll also learn to use the skills and knowledge you acquire in your disciplinary training another way: to discover and seize new opportunities.

Why do you use the keyword opportunities to describe the end-point of iTeams instead of markets or applications?

This is easiest seen working backwards from a future in which you’ve already attained impact. The technology you chose is an earlier incarnation of the technology that makes that impact possible, the community your innovating serves benefits from a constellation of elements that you’ve choreographed to work together at the adequate scale: an organization, several technologies (old and new) and people to name some. Everything, the advantage, the constellation of elements, and the work left to be done hinges on the impact. Back to the present, before that impact is material, you must appraise an opportunity.

Why do you expect the technology to offer an unfair advantage?

Scaling up a technology from lab to society is a significant task. The effort entails revisiting variables and assumptions done at lab scale, discovering what else needs to be proven to make the same principles work in a different set of conditions beyond what the lab tested for, as well as exploring tradeoffs and scale invariants driven by the end-point you foresee. Whether you are producing a new industrial plant or scaling-
up software, scaling up a new technology takes more resources than using a technology that has already been proven at scale by someone else. It would be unwise to expend resources to scale up a technology that can be replicated easily with something else that already exists. So, you better demand your technology supplies you with a sustained and significant advantage that justifies the effort to scale it up. We use the word *unfair* to stress how significant you need the advantage to be to compensate for the costs of scaling up.

**What do you mean by space of opportunity and how is that different from just an opportunity?**

Working from the present, your biggest risk is driven by the development required to move a technology from the lab to society without clear evidence suggesting that the end-point you envision can work. This is a significant scale-up process. Banking all development on a single opportunity being true is unnecessarily risky. Following traditional risk-assessment principles, the more diversified an opportunity the lower the risk. However, when scaling up, maintaining diversified opportunities, a technology platform, or a similar degree of options open will almost always increase scale-up cost. The way around is to find a way to explain how knowledge acquired about one opportunity reveals something about another distinct opportunity. If you have such a means of relating opportunities to one another and trading information about them, no matter how distinct, we say you have a space of opportunity. To describe one such space we ask that you outline three distinct opportunities and that you produce next steps for your project that contribute evidence for all opportunities.

*Note for the mathematically inclined: we are using the keyword space much like you might in algebra, roughly you need a way to locate points – opportunities – and a way to measure distance between them – next steps.*

**What do you mean by “iTeams puts to test some deeply held beliefs about entrepreneurship and innovation”?**

We believe strongly that innovating is practicable, doable, and you can go about it systematically, and that’s how we set out to teach it, it is a staple of what makes iTeams unique. However, as some of your peers and now alumni point out, innovating does not start out being intuitive. At times, it may appear to run counter to what you learn in other courses. It really doesn’t. But things do tend to look quite different in hindsight compared to how they present themselves when you and everyone else approaches them for the first time. Innovating has you looking forward at a problem that is still undefined and unsolved.

We all respond differently to content that runs contrary to our intuition: we resist the content, suspend disbelief, find it fascinating, grow skeptical, or dismiss it outright. We would like to point out that what makes something counterintuitive isn’t the “thing” itself but the background from which you are looking at it. All those reactions are, as a matter of fact, learning indicators; at some point in your childhood everything was counterintuitive (cognitive research suggests so) and you overcame it.

Whatever your reaction to the content of iTeams, please feel free to share it with us as we go, it makes the class all the more interesting!

Uncertainty and novelty are a staple of innovating, and learning to deal with them so you can advance is a critical skill we need to help you acquire as part of the class objectives. Thank you for playing with us!