# Course Form for PKU Summer School International 2018

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| **Course Title** | Becoming a Medtech Entrepreneur -- What is Biodesign? <br> 生物医学技术创新与创业 |
| **Teacher** | Robert CHANG |
| **First day of classes** | July 13, 2018 |
| **Last day of classes** | July 27, 2018 |
| **Course Credit** | 2 credits |

## Course Description

**Objective**

This course introduces the Stanford University Biodesign process (http://biodesign.stanford.edu), which is design thinking for medical device innovation. Also, the lean launch methodology will be integrated to cover customer development work for commercialization. The overall course theme focuses on digital health, but concepts of medical regulation, intellectual property, and startup fundraising are included. Thus, this short course offers a broad view of medtech entrepreneurship to begin to demystify the challenging path of healthcare innovation and is the basis for further study in unmet medical needs, rapid prototyping, and business modeling. Students are expected to learn about the vaunted Silicon Valley environment of innovation and to gain a new perspective on what it takes to become a successful medtech entrepreneur. Ideally, small teams of students from medicine, engineering, and business can apply to join the course together.

**Pre-requisites /Target audience**

At least one developed skill focus in either medicine, engineering, or business
Senior undergraduate students and graduate students interested in healthcare innovation

**Proceeding of the Course**

Exposure to startups

**Assignments (essay or other forms)**

Reading, Group Work, Final Presentation

**Evaluation Details**

Attendance and Reading: 30%
Project: 40%
Exam: 30%

**Text Books and Reading Materials**

1. Yock, Zenios, Makower. Biodesign: the Process of Innovating Medical Technologies. Cambridge University Press, ISBN-13: 978-1107087354, 2015.
2. Ries. The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses. Crown Publishing Group, ISBN-13: 978-0307887894, 2011.
3. Osterwalder. Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. John Wiley and Sons, ISBN-13: 978-0470876411, 2010.
4. Hou. Startups Demystified: Founders Share Strategies, Secrets, and Lessons Learned. Coffee Cup Press, ISBN-13: 978-0692822951, 2018.
5. DiResta, Forrest, Vinyard. The Hardware Startup: Building Your Product, Business, and Brand. O'Reilly Media, ISBN-13: 978-1449371036, 2015.
6. https://steveblank.com/books-for-startups/

**Academic Integrity (If necessary)**

| CLASS SCHEDULE |
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| (Subject to adjustment) |

| Session 1： *Biodesign Concepts, Digital Health, Strategic Focus* | Date:7/13 |
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| 【**Description of the Session**】(**purpose, requirements, class and presentations scheduling, etc.**) Biodesign Overview and finding your niche. | |
| 【**Questions**】 | |
| 【**Readings, Websites or Video Clips**】 | |
| 【**Assignments for this session (if any)**】 | |
| Session 2： *Need Statement, Observation* | Date:7/16 |

【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)** What is a need statement? How to identify unmet needs?

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

| Session 3：*Need Filtering, Specification* | Date:7/17 |
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【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)** Deciding on a top unmet need.

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

| Session 4：*Healthcare Overview* | Date:7/18 |
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【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)** Understanding how healthcare works.

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

| Session 5：*Design Thinking Principles, Brainstorming* | Date:7/19 |
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【**Description of the Session**】(**purpose, requirements, class and presentations scheduling, etc.**) How to generate new ideas focused on a specific user.

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

| Session 6：*Business Model Canvas* | Date:7/20 |
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【**Description of the Session**】(**purpose, requirements, class and presentations scheduling, etc.**) How to make it sustainable.

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

| Session 7：*Regulatory, Prototyping* | Date:7/23 |
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【**Description of the Session**】(**purpose, requirements, class and presentations scheduling, etc.**) Typical medtech startup milestones.

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

| Session 8： *Intellectual Property, Incorporation, Equity* | Date:7/24 |
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【**Description of the Session**】 (**purpose, requirements, class and presentations scheduling, etc.**) What to do when you're ready to start your company.

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

| Session 9： *Venture Capital, Fundraising* | Date:7/25 |
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【**Description of the Session**】 (**purpose, requirements, class and presentations scheduling, etc.**) Where does the money come from?

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

| Session 10：*How to Pitch* | Date:7/26 |
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| 【**Description of the Session**】(**purpose, requirements, class and presentations scheduling, etc.**) Crafting the ideal story. | |
| 【**Questions**】 | |
| 【**Readings, Websites or Video Clips**】 | |
| 【**Assignments for this session (if any)**】 | |

| Session 11： *Final Pitches* | Date:7/27 |
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| 【**Description of the Session**】(**purpose, requirements, class and presentations scheduling, etc.**) Final Project Presentations | |
| 【**Questions**】 | |
| 【**Readings, Websites or Video Clips**】 | |
| 【**Assignments for this session (if any)**】 | |

**A CV of 250-300 words and a high-resolution personal photo should also be provided**

**Title in English: Becoming a Medtech Entrepreneur -- What is Biodesign?**
**Professor：Robert Chang**

   Professor Chang is a medical innovator and an assistant professor of ophthalmology on faculty at the Byers Eye Institute at Stanford University. As a full-time glaucoma and cataract surgeon and clinician scientist, Dr. Chang spends his time teaching the latest minimally invasive eye surgery techniques as well as researching new technologies such as machine learning, portable imaging, wearables, digital health, and telemedicine.

   He is co-inventor of the first universal smartphone adapter to take pictures of the front and back of the eye, licensed to Digisight Technologies as the FDA-cleared PAXOS scope. He also co-founded a venture-backed connected health device startup and has created an original extended hackathon medtech entrepreneurship course, which has international exposure including the annual DreamCatchers MedTech Hackathon in Hong Kong (www.dreamcatchers.hku.hk/), the Stanford Center at Peking University in Beijing (www.dhealthclass.com/), and the HIPUC Bootcamp in Brazil (hipuc.com, hilab.org).

   Dr. Chang received his MD from the combined BA/MD program at the University of Missouri, Kansas City School of Medicine. He completed his residency at the prestigious Washington University in St. Louis, followed by a research and clinical glaucoma fellowship at the renowned Bascom Palmer Eye Institute in Miami. He has published over 40 peer-reviewed papers, delivered more than 100 invited national and international lectures, been awarded many grants, holds multiple patents, and advises medical device, biopharma, and startup companies on a regular basis. Currently, he is Vice President of the Asia Pacific Tele-Ophthalmology Society (APTOS).