

**ACAD 499: Citizen Science (Impact Lab)**

**Units: 2**

**Spring 2020– Thursdays 5-6:50pm**

**Instructor:** Dr. Samir Chatterjee

**Office:** TBA

**Office Hours:** By Appointment

**Contact Info:** samircha@usc.edu.

*Timeline for reply: within 48 hours.*

**Classroom Assistant:** TBA

**Office Hours (if applicable):** N/A

**Contact Info:** trentjon@usc.edu

**IT Help:** <https://iovine-young.usc.edu/ait/index.html>

**Hours of Service:** 8:30am - 5:00pm

**Contact Info:** [iyhelp@usc.edu](mailto:iyhelp@usc.edu), 213-821-6917

## Course Description

Impact Lab is a course dedicated to help students learn how to conduct research and development working closely in conjunction with an industry partner. The USC *Michelson Convergence Science Institute* has given us a prompt related to their ongoing Cancerbase project. A student team will define, assess, and, ultimately, propose a solution to the prompt (see below). Impact Lab follows the Learn, Invent, Make, Report process to creative problem solving. The course will begin with a deep dive into the context of this particular prompt through desk research, stakeholder interviews, and problem statement exercises. Next, students will be guided through a rapid ideation session in order to develop conceptual directions for the proposed solutions. Students will become familiar with technologies such as EHRs, PHRs, Health Exchanges, Wearable Computing, Cloud Computing and mHealth app developments. After pitching the proposed directions to the Michelson group, students will engage in rapid prototyping, user testing, and concept refinement. Finally, the course will end with a capstone presentation of the recommendations and a report. There is a good potential that the findings from this industry lab may be published as a peer-reviewed paper.

Today ONC has an initiative called the Blue Button. By clicking that button, nearly 50 million patients (including cancer patients) can download their medical data. But can they comprehend that data?

RQ1: What format is this data in? How can we extract that machine-readable data and present that to the patient to engage them more?

RQ2: Blue Button is a static dataset downloaded at some point of time. Patients may also be actively monitoring their own health data. How do we integrate them in a prototype that visualizes the data? What product can be designed to engage the cancer patients so that they can contribute more of their own health data?

### Links of this project to USC Michelson Convergence Science Institute initiatives in Cancer:

Cancerbase is an ongoing initiative within the Kuhn Lab. It is a platform where the goal is for patients to donate their own health data as a contribution to scientific discovery. Our hope is to enable them to learn more about their own disease through aggregation of patient submitted health data. This prototype is a step towards that.

### Team Skill Sets:

1. Someone who can do usability testing and user design research.
2. Developers for prototype (web programming & mobile programming background)
3. Design and design thinking, UI and UX
4. Some domain knowledge or interest in health is desirable
5. Data visualization

### Learning Objectives and Outcomes

By the end of the course, students will become experts at aggregating medical records and personal health data to contribute towards scientific discovery which in turn leads to better understanding of disease. They will have gained experience working as a Design Strategist in a real-world context, and will obtain skills in creative problem solving, client relations, creative collaboration, project management, and design research. Students will work in teams to engage in two unique projects designed to address specific concerns by developing and applying innovative and unconventional skillsets.

## Required Readings and Supplementary Materials

Suggested readings and supplementary materials:

1. Caren Cooper. (2016). *Citizen Science: How Ordinary People Are Changing the Face of Discovery*. Overlook Press: New York, NY.

Papers:

Lee, J.S.H., Darcy, K.M., Hu, H., Casablanca, Y., Conrads, T.P., Dalgard, C.L., ..., Shriver, C.D. From discovery to practice and survivorship: Building a national real-world data learning healthcare framework for military and veteran cancer patients. *Clinical Pharmacology and Therapeutics*. 2019; DOI: <https://doi.org/10.1002/cpt.1425>

Ramamoorthy, A., & Huang, S. M. (2019). What does it take to transform real-world data into real world evidence? *Clinical Pharmacology & Therapeutics*, 106( 1), 10– 18.

Sherman, R. E., Anderson, S. A., Dal Pan, G. J., Gray, G. W., Gross, T., Hunter, N. L., ... Califf, R. M. (2016). Real-world evidence—What is it and what can it tell us? *New England Journal of Medicine*, 375( 23), 2293– 2297.

The Blue Button Fact Sheet. Accessed at <https://www.healthit.gov/sites/default/files/blue-button-fact-sheet-2014-feb-0.pdf>

## Description and Assessment of Assignments

The following is a breakdown of the assignment expectations. Unless otherwise noted, all submissions will be in the PDF format, and will be due prior to the class session via email.

1. **Problem Definition:** Students will be challenged to distill their research findings into a single sentence that captures each problem they are solving for each client prompt. These statements should include the key stakeholder of interest, the experience of that stakeholder (key tasks, and related steps to fulfilling those tasks), the identified obstacle, as well as the stakeholder mindset (emotion). *You can also write a paragraph description illustrating the problem you are tackling.*
2. **Background and Related Research Documentation:** The team will extensively survey the literature on what has been done in this particular area. Not only academic peer-reviewed conference and journal articles should be covered but also state-of-the-art practice white papers can be considered. This background and related work section should be about 3-5 pages maximum. *There must be one research document from the group.*
3. **Design Solutions and Alternatives:** After having a good grasp of the problem at hand, the team must come up with conceptual and preliminary designs of their proposed solution. At least 1-3 different alternative solutions must be designed. Brief write-up about each solution must be submitted.
4. **Design Solution Presentation and Midterm Updates:** The design solution choices must be presented to the Michelson Cancerbase team for feedback.
5. **Prototype Design, Development:** The team must utilize Rapid Prototyping to demonstrate a working and feasible artifact. It can be a website, a smartphone app or something else. Pay particular attention to usability and user experience. Focus groups may be conducted during this time.
6. **Testing & Evaluation:** Your final prototype must be tested by a small group of pilot stakeholders. It could be a sample of 5 cancer patients. Collect all the data. You may need IRB clearance.
7. **Final Project Presentation:** It's showtime! Details of expectations TBD.
8. **Participation:** Students are expected to be active participants in and out of the classroom, contribute towards their team and projects, but also assist other fellow classmates. Many weeks we can meet over Zoom online.

## Grading Breakdown

<b>Assignment</b>	<b>Points</b>	<b>% of Grade</b>
Problem Definition	100	10%
Background & Related Research Documentation	150	15%
Design Solution Alternatives	100	10%
Prototype Development	200	20%
Test and Evaluate	100	10%
Final Project Presentation	100	10%
Final Project Deliverable	150	15%
Participation	100	10%
<b>Total</b>	<b>1,000</b>	<b>100%</b>

## Grading Scale

Course final grades will be determined using the following scale

A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

## Assignment Submission Policy

Unless otherwise noted, all assignments must be submitted as a PDF presentation. For assignments delivered in class (such as presentations), the work must be completed before the commencement of the class session in which the assignment is due. For assignments that are designated for virtual submission, one team member is expected to submit the assignment to [manosm@usc.edu](mailto:manosm@usc.edu) (unless otherwise specified) by COB (6:00pm) the day the assignment is indicated as due.

## Grading Timeline

Grades and feedback for all assignments will be returned to students within one week of submission.

## Academy Attendance Policy

The Academy maintains rigorous academic standards for its students and on-time attendance at all class meetings is expected. Each student will be allowed two excused absences over the course of the semester for which no explanation is required. Students are admonished to not waste excused absences on non-critical issues, and to use them carefully for illness or other issues that may arise unexpectedly. Except in the case of prolonged illness or other serious issue (see below), no additional absences will be excused. Each unexcused absence will result in the lowering of the final grade by  $\frac{1}{3}$  of a grade (e.g., an A will be lowered to A-, and A- will be lowered to a B+, etc.). In addition, being tardy to class will count as one-third of an absence. Three tardies will equal a full course absence.

Students remain responsible for any missed work from excused or unexcused absences. Immediately following an absence, students should contact the instructor to obtain missed assignments or lecture notes and to confirm new deadlines or due dates. Extensions or other accommodations are at the discretion of the instructor.

Automatically excused absences normally may not be used for quiz, exam or presentation days. Using an excused absence for a quiz, exam or presentation, such as in the case of sudden illness or other emergency, is at the discretion of the instructor.

In the case of prolonged illness, family emergencies, or other unforeseen serious issues, the student should contact the instructor to arrange for accommodation. Accommodation may also be made for essential professional or career-related events or opportunities. All accommodations remain at the discretion of the instructor, and appropriate documentation may be required.

### **Additional Policies**

Assignments will be accepted after the deadline with the following grade penalties. Do not ask for extensions; the below are the extensions.

- Submission in the 24 hours after the deadline 10% deduction
- Submission between 24 and 48 hours after the deadline 20% deduction
- Submission between 48 hours and 3 days after the deadline 50% deduction
- Submission more than 3 days after the deadline 100% deduction

## Course Schedule: A Weekly Breakdown (Deviations may be necessary)

Week	Session details
Week 01	<b>1/16: What we know – getting to understand the prompt</b>
Week 02	<b>1/23 Developing problem description and problem statement</b> Chapter 1 and 2 of Cooper Book
Week 03	<b>1/30 Meet the client</b> – Dr. Peter Kuhn and Sara Ma from Michelson Convergent Science Institute
Week 04	<b>2/6 Dr. Jerry Lee presents APOLLO network for citizen science</b> <b>Class discussion on</b> Sherman, R. E., Anderson, S. A., Dal Pan, G. J., Gray, G. W., Gross, T., Hunter, N. L., ... Califf, R. M. (2016). Real-world evidence—What is it and what can it tell us? <i>New England Journal of Medicine</i> , 375(23), 2293– 2297.
Week 05	<b>2/13 Problem definition document due</b> <b>Chapter 5, 6 and 7 of Cooper Book</b>
Week 06	<b>2/20 What do we know about the ONC Blue Button Initiative</b>
Week 07	<b>2/27 First results from scanning related work and background literature</b>
Week 08	<b>3/5 Background Literature and related Word document due</b> <b>Chapter 10 of Cooper Book</b> <b>Brainstorming Design Solution Alternatives</b>
Week 09	<b>3/12 Finalizing prototype design</b>
Week 10	<b>3/19 SPRING RECESS NO CLASSES</b>
Week 11	<b>3/26 Design Solution Presentation to Michelson Group – Getting feedback</b>
Week 12	<b>4/2 Class discussion on</b> Ramamoorthy, A., & Huang, S. M. (2019). What does it take to transform real-world data into real world evidence? <i>Clinical Pharmacology &amp; Therapeutics</i> , 106(1), 10– 18. <b>Prototyping and Rapid Visualization of the solution</b>
Week 13	<b>4/9 Functional Testing</b>
Week 14	<b>4/16 Pilot testing for 1 week with small group of cancer patients</b> <b>Data collection and analysis</b>
Week 15	<b>4/23 Final presentation to Michelson group – Dr. Peter Kuhn and Sara Ma and IYA faculty</b>
	<b>5/1 Final report emailed to instructor</b>

## Statement on Academic Conduct and Support Systems

### Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

### Support Systems:

*Student Health Counseling Services - (213) 740-7711 – 24/7 on call*  
[engemannshc.usc.edu/counseling](http://engemannshc.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*  
[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP)*  
-213-740-9355 (WELL)

<https://studenthealth.usc.edu/sexual-assault/>

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Relationship and Sexual Violence Prevention and Services provides immediate therapy services for situations related to gender- and power-based harm (e.g., sexual assault, domestic violence, stalking). (wording from the site)

*Office of Equity and Diversity (OED) | Title IX - (213) 740-5086*  
[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

*USC Policy Reporting to Title IX (213) 740-5086*  
<https://policy.usc.edu/reporting-to-title-ix-student-misconduct/>

The university encourages individuals to report prohibited conduct to the *Title IX Office*. Individuals can report to the university *Title IX Coordinator* in the *Office of Equity and Diversity*.

*Bias Assessment Response and Support - (213) 740-2421*  
[studentaffairs.usc.edu/bias-assessment-response-support](http://studentaffairs.usc.edu/bias-assessment-response-support)

Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

*The Office of Disability Services and Programs - (213) 740-0776*  
[dsp.usc.edu](http://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Support and Advocacy - (213) 821-4710*

[studentaffairs.usc.edu/ssu](http://studentaffairs.usc.edu/ssu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.