



2019-20 Annual Report

Prepared in June 2020

Directors' Note

We welcome you to the Fung Institute for Engineering Leadership and our annual report for 2019-20. This past year has seen many successes and unforeseen challenges for the institute. Even in this time of great uncertainty, we look forward to a year of careful planning, hard work, and yes, further successes, as we respond to the pandemic and take the institute to new heights.


You'll find the details inside, but at the highest level, 2020 saw the following highlights:

- Welcoming our new Executive Director, Stephany Prince
- Graduation of 480 Master of Engineering students, the most ever
- Graduation of 55 Fung Fellows and launch of the Honors track
- The (unanticipated) movement of all FI teaching online, maintaining quality student satisfaction rates for our signature experiential capstone projects
- Launching of the Fung Institute Industry Partners Program (FIIPP)
- \$120K in corporate support for the IP Strategy Concentration
- Over \$500K in research grants for the Fung Fellows
- \$200K aid to students confronted with financial challenges caused by the pandemic

Despite a surely tumultuous year ahead, we are moving ahead with flexible plans for ever better education, program growth, and increased industry participation. Highlights include:

- Launch of the new Conservation track for the Fellows, starting Fall 2020
- Launch of new concentrations and flexibility in the MEng
- Accommodating an MEng class of 449, not including deferrals
- Increasing the proportion of community and industry-led capstone projects
- Doubling our space to accommodate future growth

Finally, we want to highlight all of the exceptional work done by the staff at the Fung Institute. This work was even more exceptional this past year, as it was often done from home (with help from children!) and included a phenomenal variety of added tasks and stress.



Lee Fleming
Faculty Director



Stephany Prince
Executive Director

Facilities Update

SHIRES HALL

This summer, we will be upgrading six of our rooms, including some of the classrooms, to have Zoom capabilities and allow for distance learning in the fall.

MUDD HALL

- Final lease was signed April 2020
- Expected construction to begin July 2020
- Expected move in date is April 2021
- Additional 12,176 rentable square feet with plans for:
 - 1 tiered classroom
 - 1 flexible classroom
 - 5 breakout rooms
 - student study space
 - breakout room
 - space for 8 staff members
- All classrooms and breakout rooms will have Zoom capabilities.



CLASS OF 2020:

This spring brings the bittersweet virtual graduation celebration for our largest MEng graduating class ever at 480 graduates. Our staff and instructors managed 30% growth in both the student and applicant populations growth through innovation in marketing, recruitment, events, teaching and program improvements. One highlight was the addition of two new leadership electives to January Boot Camp: Professional Ethics in Law, Technology and Business, and Global Business Innovation.

We facilitated the first Fung Institute custom Classroom Climate workshop with case studies for Engineering Leadership Instructors and GSIs. This one one of the first such workshops put on within the College of Engineering.



IMMEDIATE RESPONSE TO COVID-19:

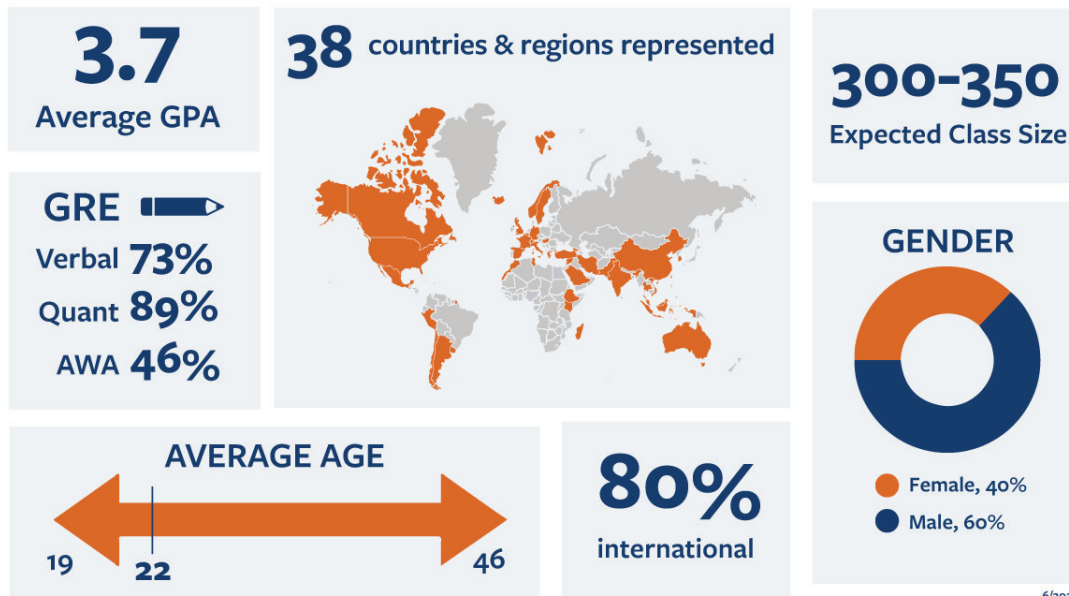
- **Virtual Front Desk** - quickly transitioned from in-person advising to virtual advising; added a COVID-19 resource section in the MEng Student Portal.
- **Student Check-In Survey** - Personal outreach and a needs assessment survey to check in with MEng students about their status and needs during the COVID-19 crisis.
- **COE Emergency Fund** - Release of over \$220,000 in funds for grants up to over 125 MEng students for basic needs.
- **Program Extension** - Offered a third semester extension to over 60 MEng students who wanted to extend their student status for academic and professional reasons; either with a \$8,000 grant or switch to pay per unit for part-time enrollment.

PROGRAM RECRUITMENT:

- **Domestic recruitment** - Attended more than 11 graduate fairs in California and out of state.
- **International recruitment** - Trips to Europe (UP Madrid, ESSEC and Ecole Polytechnique in Paris) and Asia (Kuala Lumpur and Singapore)
- **Diversity recruitment** -
 - GEM Grad Fair at UCSD: Geared towards first gen, low-income, historically underrepresented students interested in pursuing graduate degrees in STEM
 - Graduate Pathways to STEM (GPS): GPS promotes graduate school opportunities to underrepresented minorities (URM), first generation and low income students at Bay Area, Northern California and select Southern California universities.
- **Increased scale of admissions interviews** - 44 MEng students and alumni completed over 530 Interviews of Applicants for inclusion in departmental admissions review - this is a great yield tool as well as for determining fit for the program.
- **Digital marketing** - FI marketing channels including the website, emails, social media, and blogs experienced overall growth in terms of prospective student reach, alumni, industry, and current student engagement, and brand awareness.

ENTERING CLASS OF 2021

Our recently admitted class at 565, chosen from a 30% larger applicant pool than last year, and with the largest percentage of women planning to enroll, was poised to continue the program's fast growth. But visa office closures, a new Presidential Proclamation which impacts Chinese graduate students, and the hesitations of students about probable online learning, makes our fall class size unpredictable; we expect a significant number of deferrals and hope to retain 250-300 students for the fall.



Prior to deferral requests, MEng maintained a high admit yield of 55%, even as Visit Day went online and students were just starting to experience a great deal of uncertainty.

We are exploring new, more flexible MEng program options, including new concentrations, a formal third semester option for specific concentrations, online MEng for working professionals and the addition of an emphasis in Entrepreneurship and Innovation.

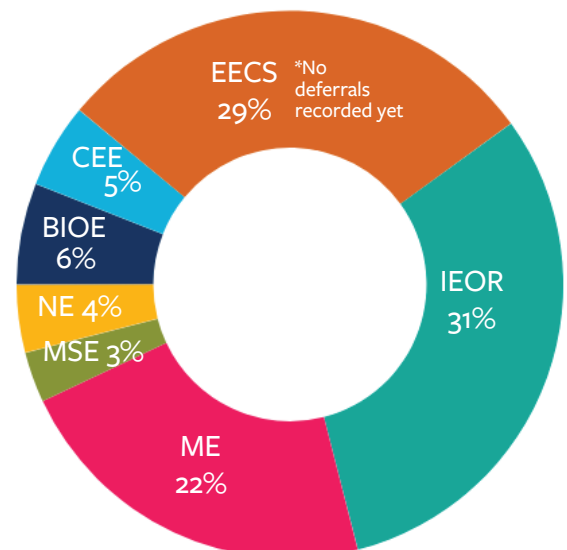
2020-21 ENTERING MENG CLASS PROFILE

- 30% Admit rate (down from 38% in 2019)
- 40% Female (up from 36% in 2019)
- 15% CA Residents (down from 17% in 2019)
- 4 of the 5 top undergrad feeders are UC schools
- 55% yield (up from 51% in 2019)
- 80% International
- 38 countries represented, China accounts for 58% of students, US 19%
- 11 new part-time students
- 12 continuing part-time students
- 20 new Data Analytics & IP concentration students in IEOR
- 6 veterans
- Our top competitors are Stanford and Carnegie Mellon; also John Hopkins, Columbia, MIT; mostly MS or PhD programs
- Deferral requests for fall 2021: 184 (as of 6/17/20)

MENG DEPARTMENTS

Applications Received: 3,431
Admitted: 1,037
Expected Enrollment: 300-350

CURRENT SIRS AS OF 6/17 - 449 (DOES NOT INCLUDE DEFERRALS)

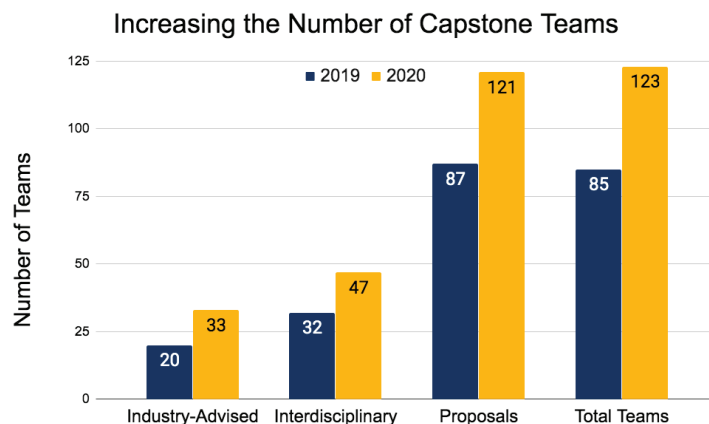


Experiential Learning

SCALING THE PROGRAM TO ACCOMMODATE OUR LARGEST MENG COHORT

This year's first challenge was to scale the capstone program to accommodate the largest MEng cohort to date. This challenge was successfully met:

- Increased the number of faculty advisors from 39 to 46 and the number of industry advisors from 16 to 24.
- Increased the number of marketplace proposals, thereby ensuring that students had a similar breadth of projects to choose from.
- Class of 2020 students had 93% likelihood of being placed on one of their top three projects.
- This year's cohort had a similar likelihood of being on an industry-advised and/or on an interdisciplinary team as the last year's cohort.



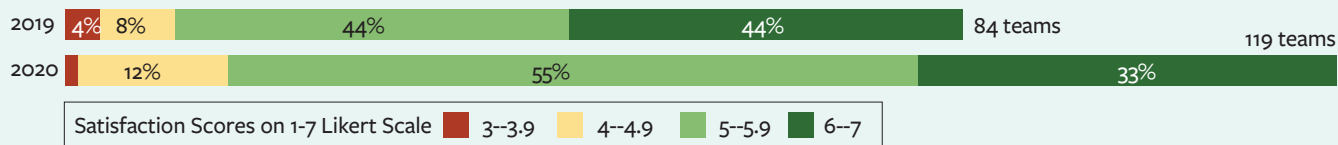
PILOTS WITH THE CAREER DEVELOPMENT TEAM

We piloted an Industry-in-Residence program that allowed industry capstone advisors to interact with MEng students beyond the two-hour capstone info fair. You can read more about MEng meetings with: [Tenaris](#), [Spacemaker.ai](#), and [Zendar](#).

We also piloted Myers Briggs Typology Indicator (MBTI) coaching for capstone teams. The pilot was a success: the 22 teams that participated in the program reported higher than average satisfaction with their capstone experience.

IMMEDIATE RESPONSE TO COVID-19:

We maintained similar levels of student satisfaction despite the COVID-19 crisis.



Students' satisfaction with their capstone projects is measured with two sets of indicators. The first focuses on capstone experience and elicits quantitative feedback on project outcomes, teaming and collaboration and advising. The second set of indicators focuses on capstone design and elicits quantitative feedback on capstone projects' technical challenge as well as opportunities to develop leadership skills.

Experiential Learning

VIRTUAL CAPSTONE SHOWCASE

The live online showcase featured nine MEng teams that represented the diversity of MEng capstone projects. The event was well-attended, with 638 registrants and 411 attendees.

Registrants included: prospective MEng students (193), current students (179), and general community (135). Attendees demonstrated a 73% interest rating, higher than expected for an online interface.

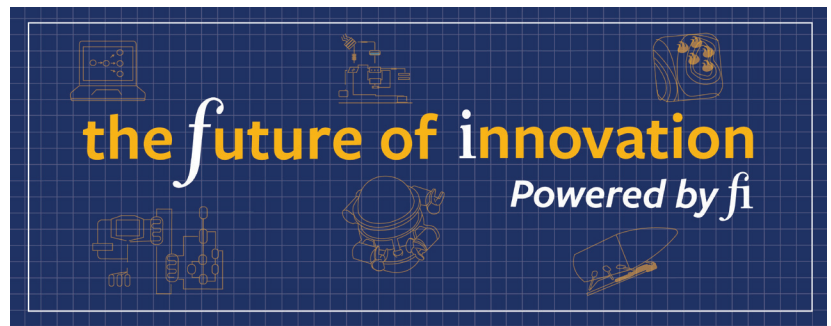
Following the event, we formally recognized approximately 10% of our total capstone teams and students. See [Berkeley MEng Class of 2020 Capstone Award Winners](#). The [2020 Capstone Showcase website](#) features project descriptions, project briefs, and pitch videos.



[Berkeley MEng Class of 2020 Capstone Award Winners](#)



[View Recording: May 7 Virtual Capstone Event](#)



TAKING EXPERIENTIAL LEARNING ONLINE NEXT YEAR

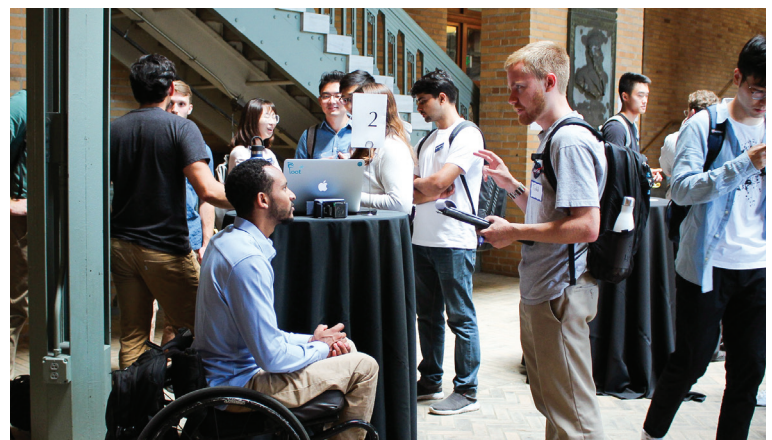
As a part of the end-of-the-year survey, we measured aspects of the capstone experience most likely to be negatively impacted by quarantine. We secured two grants to develop a curriculum that can ameliorate the impact of the three indicators most significantly impacted by students inability to be on campus:

- reaching project outcomes
- ability to keep oneself motivated, and
- collaborating with one's teammates.

INCREASING THE NUMBER OF INDUSTRY-ADVISED CAPSTONE PROJECTS

Based on our analysis of students' capstone marketplace data, capstone proposals that generate the highest number of applications have the following three characteristics:

- focus on problems related to one of the following industries: healthcare, financial services, and autonomous vehicles
- smaller, startup culture that's associated with greater autonomy & possibility of employment
- opportunities to develop machine learning, optimization, and modeling skills.



Career Development

Our services and programming merge the concepts of Career Design and Changemaking to empower students to move towards a meaningful and impactful future upon graduation and throughout their careers.

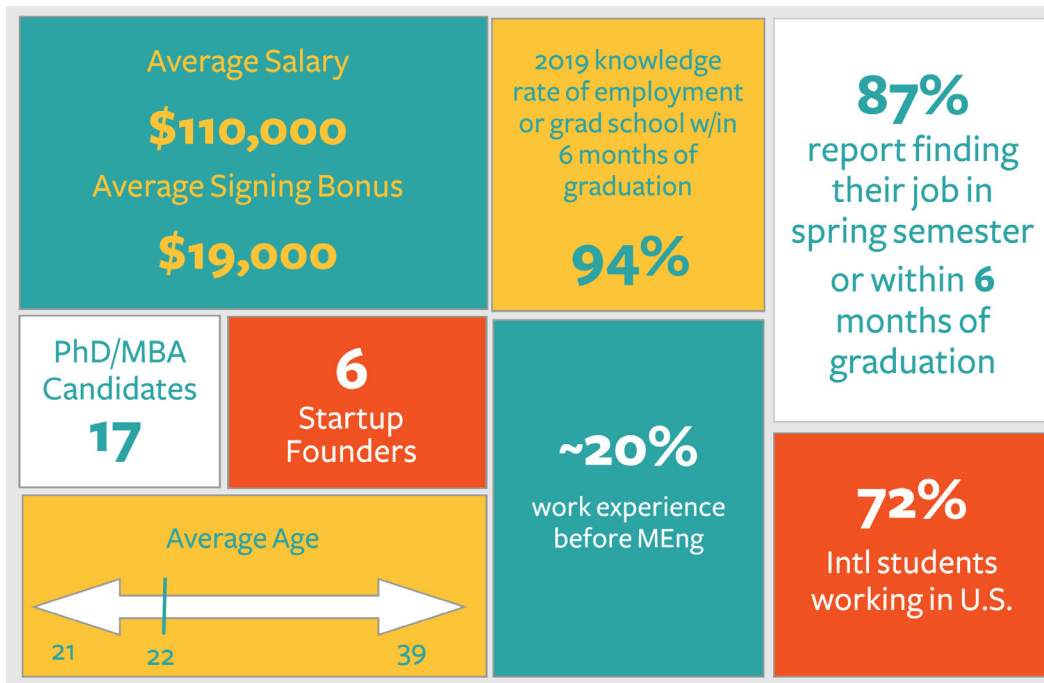
CAREER DEVELOPMENT PROGRAMMING

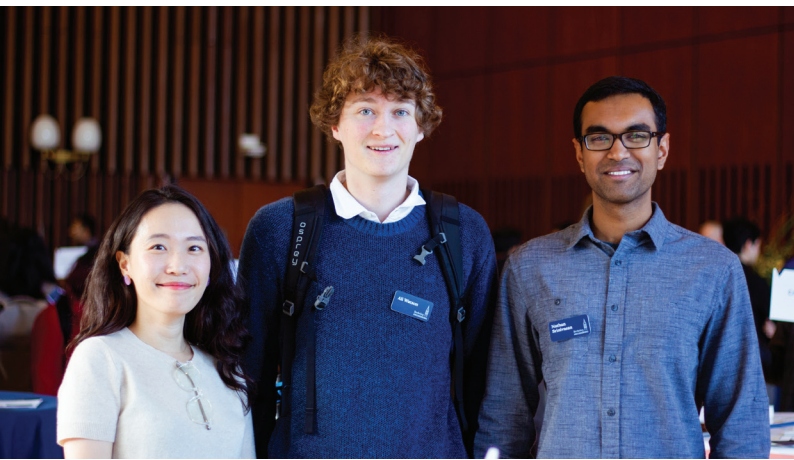
- Even with a 40% increase in students, the career team was able to engage with 20% more of the student body than the previous year by leveraging our CRM system and implementing more targeted programming.
- Career coaches conducted ~450 coaching appointments and engaged in-person with at least 75% of the class.
- To increase career readiness, 10 professional development webinars were conducted June-August.
- Over 50 unique career events that supported networking, career exploration, and professional skill development were offered August-May.
- Targeted communications included a weekly [MEng Jobs & Events Digest](#) and a monthly [CareerMail](#). We also host numerous resources on the [MEng Portal](#) and [FI Connect](#).
- Piloted this year, we offered an integrated program administering MBTI assessments and feedback sessions for capstone teams.



TRACKING OUR STUDENTS' SUCCESS

- Our current [Employment Data report for May 2019 graduates](#) is published on our website.





MENG ALUMNI RELATIONS

- Hosted in-person alumni events in Berkeley (100+ alumni attendees), Paris (17 alumni attendees), and Singapore (20 alumni attendees at this new event).
- Officially launched in 2019, FI Connect was able to digitally engage 484 alumni in professional development, networking, and recruitment through events and jobs posted.

INDUSTRY RELATIONS

- Engaged **8** capstone partners in a variety of career-related programming
- Launched the **Fung Institute Industry Partnership Program (FIIPP)** to help structure our partner engagements and highlight the value we can provide. Each partnership comes with a minimum gift of 15K. We piloted this effort with two key partners: **Asurion and Starkey Hearing Technologies.**



IMMEDIATE RESPONSE TO COVID-19:

- Developed email campaign to personally reach 500+ MEng students to assess their needs and impact on their job search.
- Created a **COVID-19 resource page** as a one stop place for information. Transitioned all career services to a virtual format.
- Continued daily 1:1 virtual coaching, drop-in hours, and held 19 alumni/industry networking events over Zoom.

NEW PARTNERSHIPS

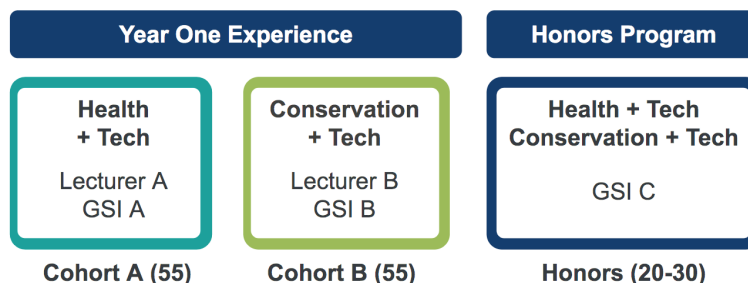
Launched in early 2020, under the same FIIPP umbrella, we plan to welcome a new level of partners specifically interested in joining as **IP and Innovation Partners:**



The end of this academic year marks the fourth year of the Fellowship and successful piloting of the redesigned 1+1 model serving 55 students in Year 1 and 20 students in the Honors Program.

REDESIGNING THE PROGRAM FOR GROWTH AND SCALE

In Spring of 2019 we redesigned the program to serve more students. The following model has been developed and will launch in Fall 2020, consisting of two Year 1 tracks of 55 students each and Year 2 Honors program with ~20 students.



CONSERVATION + TECH TRACK

Launching in Fall 2020, our new track focuses on Conservation + Tech partnering with UC Berkeley's Rausser College of Natural Resources, positioning the Fellowship to serve the next generation of environmental leaders. Faculty Advisors: [Prof. Justin Brashares](#) and G.R. & W.M. Goertz Chair and [Prof. Todd Dawson](#) and Faculty Director of Blue Oak Ranch Reserve.



[The Fung Fellowship announces a brand new track focusing on conservation and biodiversity — starting Fall 2020.](#)



[At the crossroads of public health and biodiversity conservation — not by design but ready to act.](#)

PILOTING THE HONORS PROGRAM IN FALL 2019 AND SPRING 2020

- Piloted the Inaugural Honors Program with 20 fellows and 4 partner organizations: [Elder Care Alliance](#), [Bitmark](#), [UCSF Benioff Children's hospital](#), and UC Berkeley EECS department.
- The leadership component supports another layer of peer to peer learning, facilitates professional growth, and strengthens our growing community. The Honors students mentored the first year project teams, co-taught a lab session, and participated as ambassadors across campus and during recruitment.
- Each Honors team was matched with an external industry mentor for the year long experience.

IMMEDIATE RESPONSE TO COVID-19:

- **Fellow Check-In** - Personal outreach and survey to check in with each Fung Fellow student about their location, status, and needs during the COVID-19 crisis. Teaching and program staff increased their office hours and availability to be a resource to students.
- **Self-Care Resource Support** - Began a #selfcare channel in our student Slack workplace in mid-March focusing on resources for mental health, wellness, COVID-19, and remote community building.
- **Virtual Admission Interviews** - Transitioned from the planned 120 admissions in-person interviews to virtual interviews with over 10 students and staff participating on the interview committees.
- **Fung Fellowship Course** - Fung Fellowship staff swiftly responded to changing guidelines, communicating these new expectations related to coursework, grades, and extensions to students.
- **Deliverable Adjustments** - In response to student feedback, our Teaching Team adjusted the timelines and requirements of our Spring semester deliverables to accommodate student needs.
- **Events** - Our final year events were moved to a virtual format including our Year 1 and Honors Project Showcases and our Honors Graduation celebration.

PARTNERSHIPS AND COMMUNITY ENGAGEMENT

- We actively engaged with partners in the classroom on design challenges and student projects including: [UC Berkeley Tang Center](#), [Reimagine Lab](#), [Hopelab](#), [Osher LifeLong Learning at Berkeley](#), [CareMerge](#), [SF Tech Council](#), [Tin Can Associates](#)
- For the new Conservation and Tech track we have developed a number of new partnerships including the [Wildlife Conservation Network](#), [Rainforest Connection](#), [The Nature Conservancy](#), and [Conservation X Labs](#), and [Microsoft AI for Earth](#).
- Invited to attend a curriculum workshop with [Conservation X Labs](#) in DC in December 2019 and the Informatics Education Conference hosted by University of Texas, Austin in March 2020.



OUR BROADER CAMPUS IMPACT

- Developed new partnership with Rausser College of Natural Resources and the University of California, Blue Oak Ranch Reserve.
- Hosted first [Public Interest Technology Summit on UC Berkeley's campus](#) bringing together faculty, division leaders, students, and the community to address inequities and ethical considerations of tech.
- The Fall 2019 Bootcamp [Design Challenge addressed social isolation on the UC Berkeley campus](#) partnered with the Tang Center and Clark Kerr campus. Partially funded by the UC Berkeley Student Tech Fund.

CURRENT GRANT PROPOSALS UNDER REVIEW:

- [National Science Foundation IUOE/PFE: RED A&I](#) - Revolutionizing IEOR Curriculum for the 21st Century by Adopting Active Learning Approaches partnering with UCB IEOR Department and Lawrence Hall of Science.
- [NASA's Minority University Research and Education Project \(MUREP\)](#) partnering with HBCU Oakwood University in Alabama.

AWARDED GRANT FUNDS TOTALING OVER \$500K:

- [PIT - University Network](#)



[UC Berkeley receives grant from PIT-UN to enhance curriculum and elevate the next generation of civic-tech leaders](#)



[UC Berkeley awarded \\$188,000 to grow projects at 'intersection of public service and technology'](#)

- **Partners:** Jacobs Institute of Design, CalNERDs, and the Division of Data Science
- [National Science Foundation Advancing Informal STEM Learning](#)



[NSF Investigating Measurement of STEM Engagement and Advocacy in Older Adults](#)

- **Partners:** Lawrence Hall of Science and Osher Lifelong Learning at Berkeley
- [VCRO ORU Seed Funding](#) - *Conservation + Technology = Impact: Scaling a UCB Discovery Program to Focus on Conservation and Create Authentic Leadership Opportunities for Students*
- **Partners:** UC Berkeley Blue Oak Ranch Reserve (BORR)

CO-CREATING A DIVERSE COMMUNITY OF INNOVATORS

We define diversity, equity, and inclusion broadly to include traditional metrics, gender, race, ethnicity, sexual orientation, socio-economic status, age, and expand to consider academic discipline, life experiences, perspectives, and areas of interest. Equity is a cornerstone of the program, we recruit students underrepresented (URMs) in tech and innovation programs (first-generation and transfer students, military veterans, and women), and from across majors/disciplines.

2019-20 COHORT DIVERSITY

Our third cohort students represented over 31 technical and non-technical majors and includes:

- 19% LGBTQI+
- 20% transfer students
- 22% first-generation college students
- 26% military veterans
- 48% Black, indigenous, and people of color (BIPOC)
- 61% women

“The Fellowship has given my time at Berkeley more purpose. I’ve spent a lot of time drifting through classes and I find myself more fulfilled because my work in this Fellowship feels inherently more meaningful and impactful than anything else I’ve done at Cal.”



— SHIRLEY JIANG, Data Science, '20

2020-21 RECRUITMENT HIGHLIGHTS

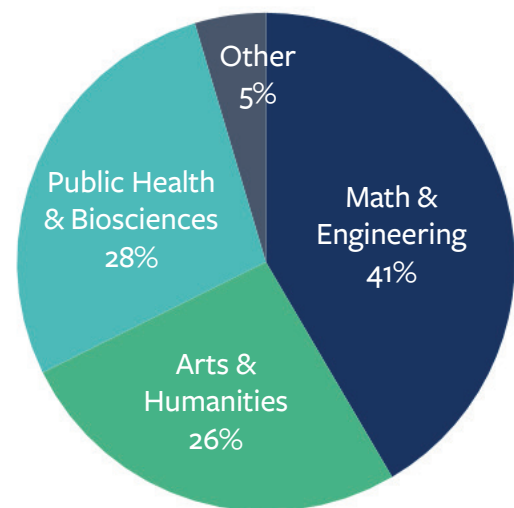
- Applications received to-date: 177
- Expected Cohort Size: 110
- Three recruitment cycles each year:
 - (1) First Year Fellows - Traditional students
 - (2) First Year Fellows - Transfer and veteran students
 - (3) Honors Fellows - Students continuing from Year 1 Experience
- During the first recruitment cycle we increased our applications by 30% since last year, representing over 30 unique majors and 63% of applicants identify as women.
- Currently we are recruiting for transfer and veteran students and that cycle will close July 31, 2020.

MEDIA

- [Got Your Back: Supporting Middle Schoolers in Digital Conversations](#)
- [Fellow Feature: Josie Lee - ‘On the Fung Fellowship, how communities can address trauma, and the ‘Emotional Revolution’](#)
- [Ismail Azam on his Forbes 30 Under 30 experience](#)



2019-20 FELLOW COHORT BREAKDOWN BY DISCIPLINE



Chief Technology Officer Updates

The world of high-technology is moving at an extremely fast pace. COVID19 has made this need for high-quality online education acute. For example:

- A diverse array of working professionals seek “knowledge upgrades” in STEM fields exists
- Working professionals need a flexible degree that adapts to rapid changes in industry
- Needs to flexibly meet growing interdisciplinary nature of modern engineering that is economical
- Should cut across the somewhat balkanized classical engineering disciplines, for a diverse audience’s needs: Civil & Environmental Engineering, Bioengineering, Electrical Engineering & Computer Sciences, Industrial Engineering & Operations Research, Mechanical Engineering, Materials Science Engineering, Nuclear Engineering

In order to deliver a high-quality experience, we are currently working on:

- (a) Best practices for resilient instruction
- (b) Equity in online instruction
- (c) Optimal training of student assistants
- (d) Online examination and proctoring processes
- (e) Online lab and design courses
- (f) Online conduct student training, etc.



MICROCOURSE INITIATIVE

We are developing targeted 1-unit microcourses for the College of Engineering (CoE) in collaboration with faculty and the Shorelight. There are several courses (90) in development now. The details follow:

- Response to ongoing societal change-emergence of online one-unit microcourses
- Small enough for a working professional/student to “squeeze” into their busy schedule
- Courses are asynchronous (pre-taped self-study) collected in a CoE Digital Microcourse Library
- Currently, there are approximated 90 courses that have been collected
- There have been three rounds of calls to the CoE faculty in 7/2019, 10/2019 and 1/2020
- Diversity of applicants: Priced and paced in such a way to be able to reach a diverse audience that would otherwise be shut-out of high-tech education at a top school.
- UCB students in any CoE programs (MEng, MDES, MTM, PhD) could take a limited number for credit