

Transfer-to-Excellence Research Experiences for Undergraduates
2018 Summer Research Program at UC Berkeley

Berkeley

UNIVERSITY OF CALIFORNIA

Transfer-to-Excellence Research Experiences for Undergraduates *2018 Summer Research Program at UC Berkeley*

Research Information & Application Packet

Please note ONLY ONLINE APPLICATIONS SUBMITTED THROUGH SUBMITTABLE WILL BE ACCEPTED. This application is being provided so that you can prepare and draft your responses before submitting them online.

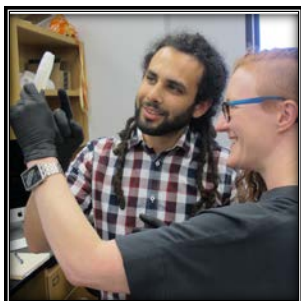


Program funded by



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Testimonials and advice from Community College students who have participated in TTE REU Program:

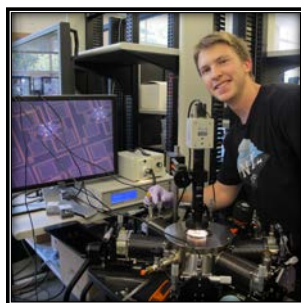


I learned a lot about the different aspects of research. I got some experience designing, troubleshooting, and actually performing my experiments. I learned a multitude of skills and technique which are fundamental to any micro or molecular biology lab. I was also able to become familiar with the dynamic of a research laboratory. I improved my ability to speak, specifically, my ability to communicate science effectively.



One of the better skills I have acquired was to learn to read and understand research papers. They are essential to understanding modern problems the world needs to solve. I also found an interesting way to look at a natural phenomenon and apply a mathematical model to it.

This experience has really reinforced my knowledge of my own love for learning. It's also shown me that I can go into a lab and do the work.

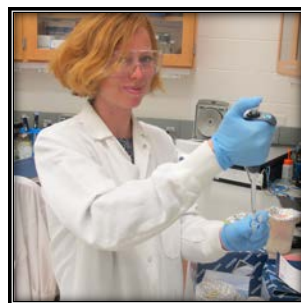


This program went above and beyond my expectations. I had expected to come in and learn some new skill, but it was so much more than that, it inspired me to follow my passions to end up doing research in something I love.



I knew that this program would be a life changing experience, but I didn't exactly know how. My ideas of research were pretty abstract - "pure science", something people kept telling me I needed to go to grad school, something people do at big universities - but I didn't understand the pacing, the process, etc. The research itself exceeded my expectations. I feel like I got to work on a project that really mattered...

It surpassed my expectations by a long shot. I put in the effort, and what I got out was so much more than I expected. I am applying to a poster competition, wrote an excellent personal statement, and fell in love with Berkeley campus.



I would tell them to definitely apply for the program because it will be worth their time. I would tell them to prepare to work very hard but that they will have a lot of support.

The Transfer-to-Excellence Research Experiences for Undergraduates focuses on three main research areas:

Biotechnology

Biotechnology draws upon knowledge, methods, and expertise from the disciplines of chemistry, biochemistry, microbiology, genetics, chemical engineering, and computer science. The ability to quickly engineer organisms in laboratories has dramatically transformed modern practices in fields such as agriculture, manufacturing, energy generation, and medicine. Students majoring in biology, chemistry, chemical engineering, and computer science will have opportunities to study the underlying science of and enhance the research tools for the biosynthetic machinery such as:

- Pathway enzymes and biocatalysis; nano-bioreactors; genome mining for new bioactive small molecules; study of plant metabolism; novel terminators and promoters; synthetic processes to improve fermentation strains and combined bioprocessing microbes; high throughput selection and screening methodologies.

Nanotechnology

Nanotechnology employs a wide range of disciplinary approaches to the engineering of matter at the nanoscale, where novel and differentiating properties and functions are manifested at the atomic to macromolecular levels. Nanotechnology has demonstrated a strong potential to overcome critical challenges in many arenas, including electronics, energy, and medicine. Student researchers who are majoring in materials science, physics, chemistry, mathematics, and engineering will have the opportunity to conduct projects in the following areas:

- *Nanomaterials*: Properties, manipulation, and application of novel nanomaterials in 2-dimensional (2D) materials (e.g. graphene nanoribbons and Transition Metal Dichalcogenides (TMDC)) and spintronic materials (e.g. nano-engineered magnetic heterostructures)
- *Novel device concepts*: Plasmonic and metal-optics devices, magnetic nanomotors
- *Device performance*: Organic thin film transistors, solar cells

Robotics

Research in **robotics** includes development of automated machines that can take the place of humans in dangerous or unreachable environments or manufacturing processes, or that resemble humans in cognition and action via the development of the underlying models and algorithms to enable artificial intelligence. The design, construct, and operate robots, as well as their control, sensory input and feedback, and information processing involves both hardware and software engineers. Students majoring in mechanical engineering, electrical engineering, materials science, mathematics, and computer science will have research opportunities in:

- *Robots*: Materials, hardware and software components; integrated sensing, actuation, control and interface systems; and product design for biomimetic millirobots and robots for space exploration
- *Assistive Devices*: Models on functioning abilities (e.g. reachable space, agility, strength, balance) of disabled versus abled people
- *Automated and Connected Vehicles*: Control architecture and algorithms, estimation and prediction models, calibration processes for sensor networks, as related to vehicle traffic
- *Mechatronics*: Synthesis tools and components for mechanical control at nano-scale

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The TTE Program also collaborates with UC Berkeley's Transfer Alliance Project (TAP). TAP is a highly successful academic advising and enrichment program that prepares low-income and otherwise educationally disadvantaged community college students throughout California to be competitive transfer applicants to UC Berkeley and other four-year colleges. TAP succeeds by providing one-to-one personalized advising including design and monitoring of individual academic course plans and assistance with transfer applications, required personal essays, financial aid forms and scholarships applications.

⌘ All Interested Eligible Students are Strongly Encouraged to Apply ⌘
Online Applications, Transcripts, Sample Work, & Recommendation Letters
must be received by Friday, January 26, 2018

I. Program Eligibility

California Community college students who

- Have completed nearly all the requirements for transfer to a 4-year institution in your intended major
- Will continue at community college this Fall and subsequently apply for junior standing transfer admission to 4-year institution from community college. ***Please do not apply to this program if you applied for and/or intend to enroll in any four-year institution in the 2018-2019 academic year (except through concurrent enrollment)***
- Are fully intending and academically prepared to apply to a 4-year institution as a community college transfer student in Fall 2018 in order to enroll in Fall 2019
- Are planning to major in a science or engineering at a 4-year institution after transfer

II. Program Basics

- Spend nine weeks at Berkeley pursuing independent research *full-time* on a topic related to your intended major under the one-to-one mentorship of a Berkeley faculty member.
 - Attend a 2-day Research Orientation to prepare you for your work
 - Attend a 5-day Lab Fundamentals Training to prepare you for your work
 - Receive on-going support from your faculty mentor and research program staff to successfully complete your work
 - At the end of the summer you will deliver an oral PowerPoint and Poster presentation on your research in a closing symposium and submit a 2-page report of your work
 - Receive a Certificate of Program Completion
- Receive free housing and meals on the UC Berkeley campus. The program will also cover transportation costs to and from Berkeley (up to \$250).
- Receive a summer stipend of \$3,600.
- Receive Berkeley course credit for your work. The program will pay for course fees.
 - Your grade will appear on a Berkeley transcript, which you can submit with your transfer application.
- Meet and share your experience with research students like yourself from community colleges across California including through planned social events.
- Attend seminars on preparing for science and engineering careers and applying to 4-year institutions.

III. Program Benefits

- You will be able to truly participate in the wonderfully diverse Berkeley intellectual, social and cultural community and familiarize yourself with issues related to your prospective major and with the world-class faculty and resources on campus.

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- You will be able to speak from authority and experience about your interest in your major in your transfer application.
- You will develop research skills and abilities that will impress admissions officers, faculty and departments.
 - *Imagine being able to describe the research you did in the lab of the chairperson of the department you are applying to!*
- Assuming you do well, you will gain a faculty advocate who can attest to your abilities.

IV. Selection Criteria

- Currently enrolled at a California community college
- Academic preparation
 - 3.25 grade point average or higher
 - You must have completed two calculus courses & three science or engineering courses, one of which has a laboratory component, before the start of the summer research program. *These courses must be completed by June 2018.*
- Plan to apply for transfer admission to a 4-year institution in fall 2018 to major in science or engineering
- Interest and maturity to conduct independent research at least 40 hours/week
- US citizen, national, or permanent resident
- Availability of faculty mentor and program funding

***Note:** No prior research experience is required. In fact, we especially encourage applications from eligible students who have not conducted research.*

V. Dates

- June 8th to August 11th
- All students are expected to attend a required orientation on Friday, June 8th.

VI. Frequently Asked Questions

Who should I ask for my letters of recommendation? Recommendations should be from faculty members and mentors. It's important for you to know what a weak letter of recommendation is: a weak letter is one that says you are a good student and nothing else. A strong letter of recommendation will be: this student is great, and then go into detail about why the recommender believes that you are so good based off of your previous interactions. Be sure to let your recommenders know that faculty and graduate students review the applications, so that they can gear their letter towards that audience.

Do I need research experience to apply? No! We strongly encourage you to apply regardless of past research experience, especially if you are an underrepresented student in science and engineering (underrepresented minorities, women, veterans, and persons with a disability). One of the goals of this program is to give research experience to students who would not otherwise be able to at their community colleges.

What majors will be considered? All science and engineering majors, including but not limited to: biochemistry, bioengineering, biophysics, chemical biology, chemical engineering, chemistry, computer science, electrical engineering, engineering math & statistics, engineering physics, genetics, materials science, mechanical engineering, molecular and cell biology, molecular toxicology, and physics.

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I am planning to transfer to a 4-year institution next fall; can I apply to the TTE REU program? No. All students must be planning to return to a California community college in the fall after participating in the TTE REU program.

I am an international student; can I apply to the TTE REU program? No. Unfortunately, we cannot accept international students for our research programs as we are funded by the National Science Foundation, a federal agency, which allows us to only fund US citizens, nationals, & permanent residents.

I am an undocumented (dreamer/AB-540) student; can I apply to the TTE REU program? No. Unfortunately, we cannot accept AB-540 students for our research programs as we are funded by the National Science Foundation, a federal agency, which allows us to only fund US citizens, nationals, & permanent residents.

What is sample work? Sample work is an excerpt of your academic or career related work (lab, computer program, test, paper, homework, etc.) that demonstrates your best work in the area you want to conduct research (no more than 5 pages). If the sample work is graded, please ensure that the grade is included.

What is the application deadline? Applications are due: January 26, 11:59 P.M. PST. Applications are accepted from early-October until January 26, 2018. It is to your advantage to submit your application early to ensure all requirements arrive in time.

When are the applications reviewed? Complete applications will be reviewed when they are turned in. The earlier an application is submitted, the earlier it will be reviewed. There are a very high number of applications received in the last days before the deadline, therefore it is to the advantage of the student to turn in their application well in advance.

How do I apply? Only online applications will be accepted. Transcripts, sample work, and recommendation letters will all be submitted through the online application form in an attachment.

Where do I send my transcripts and sample work? On the application form, through *Submittable*, you will be able to upload your transcripts and sample work directly.

Can I send in an unofficial transcript? Yes, unofficial transcripts are accepted and preferred. If admitted, you will be expected to provide an official copy of your transcript.

How will I know when my application is complete? We are unable to let you know when your application is complete before the deadline, and it is therefore your responsibility to ensure all documents will reach our office on time. All students will be emailed after the deadline to let them know if their application is complete or not.

What research topics are available? Research projects are available in the following technical areas: biotechnology, nanotechnology, and robotics. Specific projects will be assigned based on the student's technical background and interests.

What topics have past summer interns researched? See 2017 Projects on TTE REU website: <https://e3s-center.berkeley.edu/education-diversity/education/undergraduate/tte-transfer-excellence-summer-research-program/tte-program-archive/2017-2/>

I have more than one area of interest, should I include them all? Yes. Provide as much information as you can to aid TTE REU in the selection process. It is also best to be as specific as possible in order to appropriately match you with a faculty mentor.

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How are applications chosen? The selection process is primarily based on academic merit and technical preparation. A selection committee will also take into account the applicant's attributes, like technical interests, academic and career aspirations, and life experiences. Finally, UC Berkeley faculty members who have research projects for community college students select from a short list of applicants recommended by the selection committee.

How are research mentors chosen? Students are matched to a research mentor who does research in the area of the student's interest. On your application, applicant identifies research areas/centers of interest. If admitted into the program, the admissions committee does its best to place interns in one of their top choice, or in the closest area of research.

How are research projects chosen? Projects are chosen for the students based on the interests they list on their applications. We try to match the student's interests to a project that a mentor has for the summer. These projects change yearly and are dependent upon the mentor's needs. If chosen to be a part of a project, the mentee and mentor will work out between them what the project will entail.

When will I find out if I am accepted into the program? Students are notified of their acceptance into the program by March 31st.

How long do I have to accept an offer? Once you are notified of admission into TTE REU, you have one week to accept.

If accepted into TTE REU, does that guarantee admission into UC Berkeley as a transfer student? No. All TTE REU interns have an opportunity to interact with a number of UC Berkeley faculty, administrators, and students. However, acceptance into TTE REU does NOT guarantee admission into UC Berkeley as a transfer student.

How long does TTE REU Program run? TTE REU is a nine-week program. In 2018 it will run from June 8th – August 11th. Students are expected to participate for the entire duration of the program.

What if my final exams conflict with the program dates? Students are required to participate for the entire duration of the program. If your final exams conflict with the program start date, you should arrange to take your exams earlier.

Can I take classes at UC Berkeley while participating in TTE REU? No. TTE REU interns cannot take classes while participating in the program. They are expected to spend the majority of their time in lab as well as completing their TTE REU deliverables.

Is it possible for me to live at home while I do research? If accepted into the TTE REU Program you will be required to live in the dorms on campus as this is a residential program.

Can I bring a car? No. Parking is limited on campus and there is no campus overnight parking.

Other questions? Please contact Lea Marlor at tteprograms@e3s-center.org or (510) 664-4882.

VII. How to Apply?

Application Requirements

- Completed online application form

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- Two recommendations: at least one from current faculty in science or engineering
- Unofficial academic transcript from all colleges attended
- Sample work

To apply to the TTE REU program:

Step 1.

Attach your transcripts, sample work, and emails of your recommenders onto the online application form. Download or print the Letter of Recommendation Form. Provide your recommenders the form and in the online application, there is a designated section where you put the emails of your recommenders. They will receive an email from **Submittable** with instructions to submit your letter of recommendation. Please inform them of this process so they will be aware of and also remind them to whitelist **Submittable** in their emails to prevent it from being spammed.

All applications and letters of recommendations must be received by January 26, 2018. Late and incomplete applications will not be reviewed. Decisions should be emailed by March 31st.

Questions and supporting documents can be addressed to:

Transfer-to-Excellence Program
ATTN: Lea Marlor, Program Coordinator
University of California
266 Sutardja Dai Hall
Berkeley, CA 94720-1764
Fax: (510) 666-2022
Email: tteprograms@e3s-center.org

Step 4.

Complete the on-line application: <https://e3s.submittable.com/submit/93508/2018-tte-transfer-to-excellence-summer-research-program>

Please note ONLY ONLINE APPLICATIONS SUBMITTED THROUGH SUBMITTABLE WILL BE ACCEPTED. This application is being provided so that you can prepare and draft your responses before submitting them online.

Instructions: (Please Read)

- ALL applicants should complete sections I -VII and submit transcript(s). (Unofficial transcripts are acceptable)
- Tips for a Successful Application:
 - Be confident that we are eager to read your application; our questions are there to help us get to know you better, not to make you stumble.
 - Carefully Read and Follow all instructions. Read through the entire application once before filling it out.
 - Make sure you save plenty of enough time to complete the application -- to research what you want to study or research, and in terms of your essay(s) to think about what you want to write and then to write and revise. All essays should be written/revise at least 3 times and shown to teachers/academic advisors that you trust.

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- Double-check to make sure you have followed all instructions and completed all the Required Sections and provided all the requested documents. Incomplete applications will not be reviewed.
- Answer all questions honestly.

❧

I. Personal Information

Name: _____
Last First

Address: _____
Street City State Zip

Email Address: _____ Birthday: _____
Month Day Year

Cell Phone: _____ Alternate Phone: _____

Demographic Information: Why is this information being requested? Collection of this information is authorized by the NSF Act of 1950, as amended, 42 U.S.C. 1861, et seq. Demographic data allows NSF to gauge whether our programs and other opportunities in science and technology are fairly reaching and benefiting everyone regardless of demographic category; to ensure that those in under-represented groups have the same knowledge of and access to programs and other research and educational opportunities; and to assess involvement of international investigators in work supported by NSF (E3S National Science Foundation Cooperative Agreement No. 0939514).

Citizenship Status: U.S. Citizen ☐; U.S. Permanent Resident ☐; Other ☐ (Specify) _____

Gender: Male ☐; Female ☐

Ethnicity: Are you of Hispanic, Latino, Chicano, or Spanish origin? Yes ☐ No ☐

Race (Check all that apply): African American or Black ☐

Asian (e.g., Asian Indians, Chinese, Filipino, Japanese, Korean, Vietnamese, other Asian) ☐

Caucasian or White ☐

Native American or Alaska Native ☐

Native Hawaiian or Other Pacific Islander (e.g., Guamanian, Chamorro, Samoan) ☐

Other ☐ (Specify) _____

Disability: Yes ☐; No ☐; If yes, please specify: _____

Veteran: Yes ☐; No ☐; If yes, please specify branch and dates served: _____

Highest Education Level of Mother/Parent-Guardian I: Less than High School ☐; High School/GED ☐;
Some College ☐; AA/AS ☐; BA/BS ☐; Graduate School ☐

Highest Education Level of Father/Parent-Guardian II: Less than High School ☐; High School/GED ☐;
Some College ☐; AA/AS ☐; BA/BS ☐; Graduate School ☐

Educational Information:

Current Community College: _____

Cumulative G.P.A.: _____ Intended major: _____

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Intended transfer year to a 4-year institution: _____

Select the organization or groups you are involved with as a community college student (check all that apply):

- ☐ Center for Science Excellence (CSE), ☐ Mathematics, Engineering, Science Achievement (MESA),
☐ Transfer Alliance Project (TAP), ☐ UCLA Center for Community College Partnerships (UCLA CCCP),
☐ Puente Project (Puente) ☐ Other, please specify: _____

Are you currently receiving, or have you recently received a Pell grant? ☐ Yes ☐ No

II. Statement of Program Eligibility

I will be enrolling in Fall 2018 at community college before applying to a 4-year institution as community college transfer student with junior standing. I will not be enrolling at any 4-year institution during the 2018-2019 academic year (except through concurrent enrollment): Yes ☐ No ☐

III. Transcripts

- Please submit transcripts from all colleges you have attended. Your transcripts must include the classes you are taking currently.
 - Did you ever take any Advanced Placement (AP) courses or International Baccalaureate (IB) courses? If yes, please list:
- _____

IV. Personal and Academic Experience (all sections are required)

A. Essays

- 1) Please explain why you wish to conduct summer research and how this relates to your overall interests and goals, including intended 4-year institution major and future career. Please be specific about how you think this research opportunity will benefit you. (300-500 words)
- 2) Past summer program participants have found the program to be both the most rewarding and yet most challenging experience of their life -- please describe a major challenge you have encountered in your life, how you overcame it, and what you learned about yourself and others as a result of the experience. (The experience can be taken from any aspect of your life; it does not need to be related to academics) (300-500 words)

B. Research Interests

To help us best understand your research interests and match you with a faculty mentor, please answer the following questions. Please note, we will try to place you in a research experience that most closely matches your interests, but we cannot promise that you will work with any particular person or department.

- The TTE REU program is a collaboration among three research areas (robotics, biotechnology, and nanotechnology). Please indicate which area sounds most interesting to you and why? (see **Exciting Research Areas** at: <https://tinyurl.com/y72uduhc>) Maximum 150 words.
- _____

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C. Sample Work

- Please submit an excerpt of the academic work (lab, computer program, test, paper etc.) that demonstrates your best work in the area you want to conduct research (no more than 5 pages).

V. Letter of Recommendations

Two letters of recommendation are required. Complete the Letter of Recommendation Forms (pages 13 and 14) and inform your recommenders that their letters must be RECEIVED by Friday, January 26, 2018. They may send their recommendations via email, fax or regular mail to the address listed on the Form.

List below the names and contact information of your recommenders whom you will contact for a letter of recommendation.

1.	_____	_____	_____	_____
	Name	Address	Phone	Email Address
2.	_____	_____	_____	_____
	Name	Address	Phone	Email Address

VI. Program Expectations

1. The Research program will take place for 9 weeks from June 8th to August 11th. Students accepted into the program will be expected to conduct research full-time, by this we mean a minimum of 40 hours per week.

Are there any dates from June 8th to August 11th when you are not available? Yes ☐ No ☐. If yes, please list and explain why this absolutely cannot be avoided.

2. Are you able and willing to devote a minimum of 40 hours per week on your research project? Yes ☐ No ☐.

3. Research Program participants cannot work or be enrolled in courses, including community college courses, unless there are extenuating circumstances. Do you plan to work or enroll in courses while you are in the Research program? Yes ☐ No ☐. If yes, please explain the circumstances that require you to do this and how you will still be able to devote yourself to intensive research full-time.

4. All research participants are expected on to live on the UC Berkeley campus in provided housing during the entire summer program, including weekends, unless there are extenuating circumstances and you receive prior permission. Can you live on the Berkeley campus for the entire program? Yes ☐ No ☐. If no, please explain.

5. Are you applying to any other summer programs? (*This answer will in no way affect your admission prospects in the TTE Program*) Yes ☐ No ☐. If yes, please list these programs and when you will find out about these opportunities. What program is your first choice?

6. I understand that as part of the application process applicants may need to speak/meet with prospective faculty mentors and/or Summer Research Program staff. Yes ☐ No ☐

7. TTE works in collaboration with other organizations in and around UC Berkeley's campus. Some of these collaborators offer research positions to community college students over the summer. If your application is not

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selected for the TTE program, would you like to be considered for a REU position with one of our collaborators?

Yes ☐ No ☐

8. How did you learn about the TTE REU Program? _____

VII. Statement of Verification (to be read and signed by all applicants)

I hereby certify to the best of my knowledge that all information submitted on this application and in the attached required documents including essay(s) is accurate, complete and my own work. I also certify that the Transcript(s) accurately reflects my grades.

I understand that if I knowingly provide incorrect information, I will, if accepted, be immediately removed from the Summer Research Program (as applicable) and required to reimburse all costs of services provided to me.

Signature _____ Date _____

IS YOUR APPLICATION COMPLETE?

1. Have you submitted the following application material?

A. Online application ☐

B. Provided your recommenders the letter of recommendation form and informed your recommenders that their letters are due by Friday, January 26, 2018 ☐

2. Have you emailed, faxed, or mailed the following required documents?

A. Transcripts from all colleges you have attended ☐

B. Sample work ☐

Completed Applications with required documents must be received by our office on or before January 26, 2018:

Transfer-to-Excellence Program
ATTN: Lea Marlor, Program Coordinator
University of California
266 Sutardja Dai Hall
Berkeley, CA 94720-1764
Fax: (510) 666-2022
Email: tteprograms@e3s-center.org