



Transfer-to-Excellence Research Experiences for Undergraduates
2012 Summer Research Program at UC Berkeley

Research Information & Application Packet



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Testimonials from Community College students who have participated in Summer Research Programs at UC Berkeley:

"It is impossible to say in a small number of words how important the research program has been to me. My experience was infinitely productive. The summer as a whole cultivated my intellectual curiosity and gave me whole new dimensions of areas to study and consider. Research transformed my perspective on my major and what I can do with my future. The summer also taught me that I have academic strengths and abilities that I never knew I had. I was pushed hard and able with program support to rise to the challenge."

Summer 2007 Participant

My advisers were the greatest a student could ever have hoped for. The advice and encouragement they provided were definitely the high point of my summer experience.... I am definitely a few levels higher academically [than before the summer]. I finally understand the importance of the classes I am taking, I am more confident of my ability to succeed and understand the material and I just am happier since I completed my research project. This was, without doubt, one of the most positive experiences in my life.

Summer 2008 Participant

I liked that I could explore, hear, and weigh opposing viewpoints, even if they are the viewpoints of unconventional people. It gave me a whole new outlook on research and on making quick judgments. Through this experience, I became more curious and I started to question, talk and listen more, all while including dissenting perspectives... That summer, like a butterfly, I transformed from a girl who is tied and defined by the paradigms of a tight community, unsure of the world and of herself, to one who was scared of being led out to a strange learning environment, and finally to a confident woman with her own unique patterned wings and potential to reach even higher skies.

Summer 2008 Participant

It went beyond my expectations to be honest. After this whole experience, I feel more motivated than I ever have to pursue an undergraduate degree and continue doing research in engineering. I was debating staying another week just to continue working on the project. In the end, I decided I really needed that one week at home before I took off to college, but I would have done anything to have started my project earlier, even though I probably still wouldn't have seen my project all the way through.

Summer 2011 Participant

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The Transfer-to-Excellence Research Experiences for Undergraduates is a partnership among 4 organizations at UC Berkeley that have each organized summer research programs in previous years:



The Center of Integrated Nanomechanical Systems (COINS) is a multidisciplinary nanoscale science and engineering center funded by the National Science Foundation. The goal of COINS is to develop and integrate cutting-edge nanotechnologies into a versatile platform with various ultra-sensitive, ultra-selective, self-powering, mobile, wirelessly communicating detection applications. COINS research topics in nanotechnology and nanoscience.



The Center for Energy Efficient Electronics Science (E3S) is a multidisciplinary science and technology center funded by the National Science Foundation. The mission of E3S is to make fundamental and conceptual breakthroughs in the underlying physics, chemistry, and materials science of electronic systems to reduce energy consumption in electronic devices. E3S has research topics in nanoelectronics, nanomechanics, nanophotonics and nanomagnetism.



The Synthetic Biology Engineering Research Center (SynBERC) is a multi-institution research effort to lay the foundation for the emerging field of synthetic biology. SynBERC's vision is to catalyze biology as an engineering discipline by developing the foundational understanding and technologies to allow researchers to design and build standardized, integrated biological systems to accomplish many particular tasks. SynBERC has research topics in synthetic biology.



The UC Berkeley Transfer Alliance Project (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.

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☞ All Interested Eligible Students are Strongly Encouraged to Apply ☞

Applications must be Postmarked by Thursday, March 1, 2012

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 2012-2013 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 this Fall (Fall 2012) in order to enroll in Fall 2013
- Are planning to major in a science or engineering at a 4-year institution after transfer

II. Program Basics

- Spend eight 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 3-day Research Orientation 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 colloquium and submit a 4-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 \$3,200.
- 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 presentations on applying to Graduate School (including available financial aid), the many opportunities for undergraduate research at 4-year institutions and scholarships after transfer.

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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.
- 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. *If you are currently enrolled in your second calculus course or third science or engineering course, you meet the selection criteria.*
- Plan to apply for transfer admission to a 4-year institution in fall 2012 to major in science or engineering
- Interest and maturity to conduct independent research at least 40 hours/week
- US citizen or permanent resident
- Availability of faculty mentor

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

V. Dates

- June 16th - August 11th (*Students conducting research in the biosciences will be required to attend a five-day full-time laboratory preparation class, tentatively scheduled for June 11th-15th.*)
- All students are expected to attend a mandatory orientation on Saturday, June 16th at 9 AM.

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VI. Frequently Asked Questions

- *What research topics are available?*
 - Research projects are available in the following technical areas (visit each website, for more information):
 - Energy Efficient Electronic Sciences: <http://www.e3s-center.org/research/index.htm>
 - Nanotechnology and Nanoscience: http://susanb.physics.berkeley.edu/coins/?page_id=53
 - Synthetic Biology: <http://www.synberc.org/research>
- *What topics have people researched and do I have to research what others have already done?*
 - To answer the first part of your question, here are some topics students have researched:
 - *The Use of Small Molecule Efflux Pumps to Create More Efficient and Effective BioFuels* (Biofuels are fuels created from biological sources, like sugar. They are being considered as the next generation of “green” fuel products for cars and other machines.)
 - *An Investigation of the Use of Fats and Proteins for Printed Biosensors* (Examples of biosensors = glucose monitoring machines)
 - *New Techniques for the Creation of Graphene* (Graphene, formed of Carbon atoms, is highly conductive with potential for replacing the silicon chip and greatly increasing the speed of high tech devices.)
 - To answer the second part of your question: No way! The exciting thing about doing independent research here at Berkeley is that you are doing something which no one has done before ever, or in quite the same way, or using quite the same approach. Your mentor will help you choose something where you can make your unique contribution
- *I think I am interested in the Research Program but what exactly is independent research?*
 - This type of research is very exciting and probably brand new for most of you. Rather than reading and summarizing the articles or books of scholars, what you will be doing is searching for, finding and in some cases creating the appropriate and dependable raw data – which depending on your field could include numbers, laws, diaries or paintings -- and then performing critical analysis—using appropriate tools for your field including perhaps statistical software, mathematical modeling or textual analysis – to come up your own original argument.
- *What makes the research independent? Am I going to literally be on my own for 40 hours a week? How am I going to know what to do?*
 - Your mentor will meet with you once or twice a week to guide you to how to start finding data and to teach you appropriate analysis techniques. You will receive other assistance from graduate students and program staff, but yes for much of the 40 hours per week you will be working by yourself. If you plan things out right, you will find that you need all need these hours to do your project well.
 - The best way to be successful is to make sure you are able and willing to learn very quickly from your mentor, to ask lots of questions, to teach yourself lots of material and then crucially to use your newly gained knowledge to independently and creatively discover appropriate data and conduct analysis critically. *Successful research participants are passionate about doing their best, excited to learn new things and self-motivated*
- *I think I'd like to do research, but your description under makes it sound intimidating, do you have to have already done research to be selected?*
 - Definitely not! In fact, we want students who have not done research before. None of the previous research program participants had ever done independent research. We describe independent research so you know what it is, not to scare you off. We believe that knowledge is power. We do ask those interested in research to be academically prepared, eager to learn and willing to work hard.
- *Other Questions?* Please contact Dr. Sharnnia Artis, sartis@eecs.berkeley.edu, (510) 664-4467

**Transfer-to-Excellence Research Experiences for Undergraduates
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Summer Research Program Application Form

We look forward to your application!

Applications must be POSTMARKED by Thursday, March 1, 2012

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.
 - 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 M.I.

Address _____
Street City Zip

Email Address: _____ Birthday: _____
Month Day Year

Cell Phone _____ Alternate Phone: _____

Current Community College: _____ Date: _____

Cumulative G.P.A.: _____ Intended 4-year institution major: _____

Intended transfer date to a 4-year institution: _____

Cumulative G.P.A.: _____

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

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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

Race/Ethnicity (*Check all that apply*): African American or Black
Asian (e.g., Asian Indians, Chinese, Filipino, Japanese, Korean, Vietnamese, other Asian)
Caucasian or White
Hispanic, Latino, or Chicano
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: _____

II. Statement of Program Eligibility

I will be enrolling this Fall 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 2012-2013 academic year (except through concurrent enrollment): True False

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 (please type)

- 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)

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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.

- What courses, books, issues or math/scientific problems most interest(ed) you? _____

-
- Berkeley has many interesting research centers and institutes. Which two or three of these centers/institutes sound most interesting to you? (see list: <http://vcresearch.berkeley.edu/research-units/centers-and-institutes-by-subject-area>)

-
- If you could research any topic related to science or engineering, what would it be?
-

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 12 and 13) and inform your recommenders that their letters must be POSTMARKED by Thursday, March 1, 2012. 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



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VI. Program Expectations

1. The Research program will take place for 8 weeks from June 16th to August 11th, with students conducting research in the biosciences required to take part in lab preparation class tentatively scheduled for June 11th-June 15th. 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 16th to August 11th (and June 11th-June 15th for bioscience students) 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? 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



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 _____

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IS YOUR APPLICATION COMPLETE?

1. Have you completed?

- A. Sections I-VII
- B. Letter of Recommendation Form and provided your recommenders the form and informed your recommenders that their letters are due by Thursday, March 1, 2012

2. Have you enclosed/attached to the application the following required documents?

- A. Transcripts from all colleges you have attended
- B. Two Required Essays
- C. Sample Work

Completed Applications with required documents must be postmarked by Thursday, March 1, 2012 to:

Transfer-to-Excellence Research Experiences for Undergraduates
ATTN: Dr. Sharnnia Artis, Program Manager
University of California
562 Sutardja Dai Hall
Berkeley, CA 94720-1764

Questions? Please contact Dr. Sharnnia Artis, sartis@eecs.berkeley.edu, (510) 664-4467

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**LETTER OF RECOMMENDATION
DUE: March 1, 2012**

This section to be completed by the student applicant.

Name: _____

Please check one of the following:

____ I voluntarily waive all rights to review this letter of recommendation conferred by the Family Education Rights and Privacy Act of 1974.

____ I DO NOT waive all rights to review this letter of recommendation conferred by the Family Education Rights and Privacy Act of 1974.

Student Signature: _____

This section below is to be completed by the recommender and returned directly to the Transfer-to-Excellence Program Summer Research Program via fax, mail, or email. Please write a letter of recommendation addressing the student's intellectual ability, motivation for pursuing study in science and engineering, and plans for transferring to a 4-year institution to complete a bachelor's degree in science and engineering.

Recommender's Name: _____ Date: _____

Position/Title: _____

School/Other: _____

Signature: _____

Please email, mail or fax this form and your letter of recommendation to:

Transfer-to-Excellence Research Experiences for Undergraduates
ATTN: Dr. Sharnnia Artis, Program Manager
University of California
562 Sutardja Dai Hall
Berkeley, CA 94720-1764

Include "TTE REU Letter of Recommendation" on the Subject Line of emails and faxes.

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ATTN: Dr. Sharnnia Artis, Program Manager
University of California
562 Sutardja Dai Hall
Berkeley, CA 94720-1764

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