Education and Diversity

Nicole Evans McIntyre
Associate Director of Education
Education and Diversity Goals

- Professional and Leadership Development
- Community College, Undergraduates, Graduates, & Postdocs
- Broadening Participation
General Public & High School Education & Diversity Efforts
Public Outreach

- Science Festivals and Fairs
- Lab Tours
- K-12
- California Forum for Diversity in Graduate Education
Undergraduate Education & Diversity Efforts
Transfer-to-Excellence REU Program

Created a National Model of Student Transfer Success
118 total students served
Transfer-to-Excellence REU Program

- 9 week hands-on research experience at UC Berkeley
- Mentorship by faculty & graduate students
- Learn how to create & present research poster
- Learn how to write research paper
- Professional development workshops
- Technical seminars
- TAP advising for transfer to a 4-year institution (Continues for a year)
- Guest speakers, lab tours, & field trips
- Participation in online mentoring program (Continues for a year)
- $3,600 stipend plus room & board
- Travel allowance (up to $300)
Transfer-to-Excellence REU Program

89% (105) of participants are underrepresented

California transfer rate: 21-25%[1]
Nationwide transfer rate: 29%[2]
TTE transfer rate: 94% (97) of eligible students
  - 87% (84) enrolled at a UC campus
  - 59% (57) enrolled at UC Berkeley
  - 4% (4) at private universities, including 1 at Stanford
  - 7% (7) at CSU campuses
  - 2% (2) directly into UC graduate programs

[1] California Community Colleges Chancellor’s Office, 2019
[2] Community College Research Center, 2019
Transfer-to-Excellence REU Program
Online Mentoring

Program Goal: Facilitate a long-term, sustained and formalized mentoring relationship between all participants and a graduate student or post-doc mentor.

Program Objectives:
• Support participants through the application and selection process to a four-year baccalaureate institution
• Encourage participants’ pursuit of future undergraduate research opportunities
• Retaining and further stimulate participants’ interest in graduate school
• Continue to help guide participants in their career choices

Time frame: Sep. 2019 through Aug. 2020

Participants: 12 Interns & 13 Mentors
Engineering research entices community college students to pursue STEM careers

8/12/2019, by Linda Vu

Seventy percent of California's community college students neither earn a two-year associate degree nor transfer to a four-year university after six years, according to a comprehensive study conducted by the Institute for Higher Education Leadership & Policy at Cal State Sacramento.

In an effort to improve the transfer rate from community colleges to four-year institutions, a program called Transfer-to-Excellence Research Experiences for Undergraduates (TTE REU) offers California community college students an opportunity to work alongside UC Berkeley researchers. For nine weeks every summer, 15 students join labs on campus to prepare them to transfer to a four-year university and ultimately complete a bachelor’s degree in science and engineering.

In addition to research, the students also participate in seminars that prepare them for careers in science and engineering, receive advising and support to help with their transfer to a four-year institution.
Research Experience for Undergraduates (E³S REU) 2019
Research Experience for Undergraduates (E³S REU)

9-week summer residential program that offers undergraduates (engineering or physical science majors) the opportunity to conduct research in the laboratories of E³S faculty

- 73% of our interns are in STEM graduate programs
- 63% of our interns are underrepresented
E³S Internship Program (ETERN)

A paid research internship program, enabling undergraduates of E³S institutions to undertake paid research with E³S faculty

Provides:

- 10-weeks of research experience; average 10 hours per week
- Hands-on research guided by faculty advisors and graduate student mentors
- Stipend
Empowering Community College Faculty Through Research Experiences for Teachers (RET) Program

External NSF Funding: EEC-1405547
Empowering Community College Faculty through Research Experiences for Teachers (RET) Program

“Over the course of the academic year I have used the information and methods I learned during the 2018 summer RET experience in the following ways:

1. Planning of course outlines and presentations for students. This includes demonstrations, experiments and other pedagogical methods for Chemistry.
2. Integrate the suggestions of techniques by the various pedagogy workshops for curriculum development.
3. Present informally context-based techniques to Academic Senate
4. Other ways as may be necessary.”

“The RET program is exceptionally useful for the returning Community College instructors as a way to bridge advances in technology and foster relationships to the instructors who ultimately are the first line of interactions with students who may end up in the various STEM programs.”

E3S Hosted 5 RET Scholars in Summer 2019
100% would recommend the RET program to colleagues
Module 1: How do intravenous fluid solutions work?

7 videos • 215 views • Last updated on Aug 4, 2019

Professor Carlos Rojo
Human Physiology
Len Filane

- RET 2016 Participant
- Returned to work on curriculum development in 2018 and 2019
- Created a Quantum Computing course with the goal that it will be accredited for students transferring credits
Graduate Student & Postdoc Education & Diversity Efforts
Graduate and Postdoc Education

Graduate Students and Postdocs are helping to create the $E^3S$ legacy

- $E^3S$ Professional Development Certificate
- Rotation Program
- Postdoc Program
E³S Professional Development Certificate

- Mentoring
- Leadership
- Teaching
- Entrepreneurship
- Science communication
- Outreach
- Grant writing

24 certificates awarded in periods 1-9
15 certificates awarded in period 10 thus far
Education Legacy
Education Legacy in 2020

E³S is creating resources that will live on, past the center

- Online Videos
- E-Book
- Nanohub
Online Videos

• 46 Educational videos waiting to be published on YouTube
• Made by
  • Zheng Gu
  • Sapan Agarwal
  • Chris Keraly
  • Aaron Ragsdale
  • Michael Eggleston
• Need faculty review for accuracy
Faculty, please sign up now to review videos

tinyurl.com/e3svideos

Review & provide notes by Monday, December 2
<table>
<thead>
<tr>
<th>Student</th>
<th>Subject</th>
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<td>Zheng Gu</td>
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<td>A: Searching for the Milli-Volt Switch (mini course)</td>
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<td>B: The Energy Required for Switching</td>
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<td>C: Three Requirements for a Low Voltage Switch</td>
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<td>Chris Keraly</td>
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<td>Module 1-7: Measuring Voltage</td>
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Faculty, please sign up now to review videos

tinyurl.com/e3svideos

Sign up by:
Monday, October 7

Review & provide notes by:
Monday, December 2
**Objective:** To develop a comprehensive educational resource on energy efficient electronics including nanoelectronics, nanomechanics, nanophotonics, nanomagnetics to motivate high school students to pursue academic studies and careers in the STEM fields.
E³S NanoHUB

https://nanohub.org/groups/e3s
Platforms for eBook - NanoHUB

Online Portal for Nanotechnology Education
Created by Purdue University and NSF

Our mission is to support and grow the nanotechnology community and to generate new modes of discovery, innovation, learning, and engagement in the field.