

ENGINEERING AT ILLINOIS

Precollege Science and Engineering for Inner-City Middle School Students
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Context: Physics/Engineering enrollments

| | Ave ACT | Female | Hispanic | | | Black | | | Intl |
|------|---------|--------|----------|-------|------|-------|-------|------|-------|
| | | | State | K-12 | Eng | State | K-12 | Eng | |
| 2016 | 32.88 | 30.6% | 15.8% | 25.1% | 7.1% | 14.5% | 17.5% | 1.9% | 14.8% |
| 2015 | 32.84 | 23.3% | | | 5.4% | | | 1.6% | 15.0% |
| 2014 | 32.55 | 21.6% | | | 4.8% | | | 1.4% | 23.5% |



ICANEXSEL K-12 program ENGINEERING AT ILLINOIS



Successful interaction with K-12 students from underserved communities requires:

- 1. Contact with students must be sustained
- 2. Math a major part of the effort
- 3. Engage students with content and motivation
- 4. Engage parents
- 5. Work in collaboration with schools

These items are not easy to implement.





- Chicago Precollege Science & Engineering
 - K-6 program, 5&6 grades partner with UIUC math
 - Heavy parental involvement, focus on math.
 - 50% African American, 50% Hispanic
 - 85% qualify for free or reduced lunch.
 - Chi S&E a non-profit.





UIUC Engineering partners with Chi S&E



• Goals:

Collaboration between:

UIUC Colleges of Engineering & Education
UIC College of Engineering

- Students calculus ready in 12th grade
- Understand what engineering is, exposure to professionals
- Interact heavily with UIUC students.
- Professional development for CPS teachers.

• Program <u>video</u>

- Saturdays during school year (spring/fall)
- Summer camps for more intensive work

• UIUC:

- Faculty engagement, student groups.
- Curriculum
- Teacher training.
- Parent engagement.
- Organization
- Summer camp operation.



Illinois Chi S&E Alliance for Nurturing Excellence in STEM Education and Leadership (ICANEXSEL)



- 1. Check your stereotypes at the door, they are almost certainly wrong.
- 2. Sustained engagement crucial.
- 3. Math is the limitation.
- 4. Working with parents important.
 - Help them learn how to advocate for their child
 - Modes of communication crucial
- 5. Involvement of "undergrad allies" important.
- 6. Getting students into STEM environments (labs, campus, industry) crucial.





Now: K-7 grade program

- Collaboration between:
 UIUC Colleges of Engineering & Education
 UIC College of Engineering
- Recently completed summer camp
- Fall 2016: Add 8th grade
 - Curriculum will include programming
- Going forward:
 - Add a grade per year, will have full K-12 program in 2022.

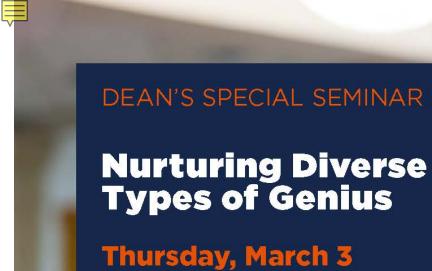


ICANEXSEL Status/Plan

ENGINEERING AT ILLINOIS

- Morrill Engineering Program (MEP)
- Engineering Pathways Program (community college)
- Women in Engineering (WIE)
- Center for Academic Resources in Engineering (CARE)
- Summer Scholars Program
- Engineering Visionary Scholarship Program
- Summer camps: GAMES, GEMS, WYSE
- Proactive admissions
- K-12 Chicago pipeline program
- Orange-shirt program
- Climate, culturally aware scientists and engineers
- Student groups
 - National Society of Black Engineers (NSBE)
 - Society for Hispanic Professional Engineers (SHPE)
 - Society of Women Engineer (SWE)
 - Departmental student groups (WCS, WECE, SWiP, ...)

Improving Diversity: Existing Efforts



4-5:30 P.M.

Room 190 Engineering Sciences Building 1101 W. Springfield Avenue



Solving a Pressing 21st Century Engineering Problem: Nurturing Diverse Types of Genius

🖚 he University of Illinois Racial Microaggressions Research Project seeks to inform the university community about issues of diversity and campus climate by conducting and publishing academic research about the experiences of students of color on a predominantly White campus. This presentation and discussion will focus on the experiences of students of color in STEM majors at the University of Illinois. The experiences of students of color will be put into the larger context of a pressing problem for engineering in the academy and in industry. The pressing problem and opportunity is how to increase the numbers of underrepresented groups and nurture diverse types of genius.





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