

WE DO THE  
IMPOSSIBLE  
EVERY DAY



## ENGINEERING AT ILLINOIS

**Precollege Science and Engineering for Inner-City Middle School Students**

**Kevin Pitts ([kpitts@illinois.edu](mailto:kpitts@illinois.edu))**

**6-Aug-16**



**2015 WIE camp**



## 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.**



**K-12 engagement**

**ENGINEERING AT ILLINOIS**

- **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**





Collaboration between:  
UIUC Colleges of Engineering & Education  
UIC College of Engineering

- **Goals:**
  - Students calculus ready in 12<sup>th</sup> grade
  - Understand what engineering is, exposure to professionals
  - Interact heavily with UIUC students.
  - Professional development for CPS teachers.

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

[video](#)

- **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)**  
ENGINEERING AT ILLINOIS



- 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**
  - Recently completed summer camp
- **Fall 2016: Add 8<sup>th</sup> 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

ENGINEERING AT ILLINOIS



DEAN'S SPECIAL SEMINAR

# Nurturing Diverse Types of Genius

**Thursday, March 3**  
**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**

**T**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.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



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