

JERROD A. HENDERSON

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EDUCATION

Doctorate of Philosophy Chemical & Biomolecular Engineering

University of Illinois at Urbana-Champaign (Illinois), Urbana, IL, 2010

Dissertation: "Tools for Modulating and Measuring Intracellular Redox Environment"

Graduate Teacher Certificate, Center for Teaching Excellence, Illinois, 2009

Masters of Science Chemical & Biomolecular Engineering, Illinois, 2007

Dual Degree Engineering Program: (3 years + 2 years program)

Bachelor of Science Chemical Engineering

North Carolina Agricultural & Technical State University, Greensboro, NC, 2003

Bachelor of Science Chemistry, Morehouse College, Atlanta, GA, 2003

Waste Management Certificate, North Carolina A&T State University, 2003

TEACHING

University of Houston: Cullen College of Engineering

Instructional Associate Professor, 2016- present

Primarily responsible for teaching as a part of the First Year Experience (FYE) Program within the Division of Undergraduate Programs and Student Success. Teach other courses as needed

ENGI 1100

- Facilitated curriculum for Introduction to Engineering (ENGI 1100)- multiple sections per semester- having taught 8 sections since Fall 2016
- Helped implemented in class laboratory modules for ENGI 1100

CHEE 2331

- Successfully taught Chemical Process Engineering (CHEE 2331) including honors sections
- Redesigned course modules using an interactive, student-centered approach

ENGI 4198

Developed new course in spring 2017 to assist "at-risk" students in their transition from freshman to sophomore year engineering problem solving ability

CHEE 4398

Taught and maintained an independent study (CHEE 4398) research methods course for my undergraduate research students (5 undergraduate researchers)

University of Illinois: Chemical & Biomolecular Engineering (ChBE) Department

Lecturer: Chemical Engineering Unit Operations & Material and Energy Balances, 2010-2016

Primarily responsible for teaching senior and sophomore level chemical engineering courses

- Incorporated unit operations, engineering trouble shooting, and safety into instruction for student centered chemical engineering courses, teaching approximately 150 students per year
- Evaluated student understanding of experiments and course material via written reports, special projects, homework assignments, and presentations
- Successfully taught Material and Energy Balances (i.e. Chemical Processes) to sections of up to 200 students

Coordinator: Open-Ended Design Projects, 2011- 2016

- Developed and integrated open-ended design projects into Chemical Engineering Curriculum
- Managed design projects for Material & Energy Balances, Introduction to the Chemical Engineering Profession & Chemical Engineering Thermodynamics
- Planned and executed Annual Design Competition with corporate judges

RESEARCH

My research focuses on engineering identity formation and persistence among underrepresented students, mapping high achieving students' progress in engineering, and preparing students for gateway courses. I also seek to understand issues of diversity and inclusion in engineering and best practices for assessment of STEM interventions.

STEM Engagement through Mentoring, Co-Founder/Director, 2013-present

- Co-founded intervention (St. Elmo Brady STEM Academy) to expose underrepresented 4th & 5th grade boys to STEM
- Trained undergraduate and graduate students to help facilitate program
- Facilitated hands-on activities, laboratory and other university facility tours
- Investigated
 - In what ways do fathers/mentors motivate students to become aware of, interested in, and prepared for STEM careers?
 - To what extent does involvement in St. Elmo Brady STEM Academy shape the students' and mentors' STEM identity?
 - What impact does working with the St. Elmo Brady Academy have on the self-efficacy of teachHOUSTON pre-service teachers with regards to teaching engineering education?

Advanced Materials Systems Summer School

Program Evaluator, Aristotle University of Thessaloniki, Summer 2017

- Created assessment plan for a ten day advanced materials research summer camp for graduate students in conjunction with University of Houston, Texas A&M University, & Aristotle University of Thessaloniki
- Provided formative evaluation report to program developers

Integrated/Cross-Curricular Design Project Research, Chemical & Biomolecular Engineering, Illinois, 2011-2012

- Assessed students' perceived usefulness of integrated design projects in chemical engineering courses
- Modified integrated design projects based upon student recommendations
- Reported findings to Chemical Engineering Department, at conferences and published articles

Funding

Current

Project Title: Collaborative Research: Windows of Opportunity-Understanding Black Male Engineers in the Pursuit of Advanced Degrees

Source of Support: National Science Foundation

Total Award Amount: \$199,447

Total Award Period: 09/01/18-08/31/21

Role: PI

Project Title: Engineering Identity Development Among Underrepresented Males

Source of Support: University of Houston - New Faculty Research Award Program

Total Award Amount: \$6,000

Total Award Period: 02/01/17-08/31/18

Role: PI

Project Title: Enhancing Underrepresented Boys' Engagement in STEM through Mentoring and Father Involvement

Source of Support: National Science Foundation

Total Award Amount: \$1,000,000

Total Award Period: 02/01/18-01/31/21

Role: PI

Project Title: Engineering/NSM Student Success Program Serving Low-Income Academically Talented Students

Source of Support: National Science Foundation

Total Award Amount: \$999,029

Total Award Period: 09/01/18-08/31/21

Role: Co-PI

Pending

Project Title: NRT-INFEWS: Materials for Food, Energy, Water, Resilience and Sustainability (MFEWRS)

Source of Support: National Science Foundation

Total Award Amount: \$2,999,994

Total Award Period: 09/01/18-08/31/23

Role: Co-PI

Project Title: Broadening Access to STEM Majors for Academically Talented Low Income Students

Source of Support: National Science Foundation

Total Award Amount: \$990,332

Total Award Period: 09/01/18-08/31/21

Role: Co-PI

Publications & Conference Presentations

Manuel, M., Greer, R.P., & Henderson, J. A., Snodgrass-Rangel, V. (2018). Engagement in Practice: STEM Engagement through Mentoring, *Proceedings of ASEE Conference*. Salt Lake City, Utah.

“STEM Engagement through Mentoring,” (2018). US-China Education Leadership and Policy Studies Forum. (Beijing Normal University).

Henderson, J.A., Greer, R.P., Summers, R. G. & Morpew, J. W. (2017). Engagement in Practice: Successes Gleaned from St. Elmo Brady STEM Academy. *Proceedings of ASEE*. Columbus, OH.

Trenshaw, K. F., Miletic, M., Schlude, J. W., Tillman, A. S., Vogel, T. J., Henderson, J. A., & Seebauer, E. G. (2015). Chemical Engineering Design Projects Across the Curriculum at a Large Research-Intensive Public University. *International Journal of Engineering Education*, 31(5), 1352-1375.

Trenshaw, K., Henderson, J., Miletic, M., Seebauer, E., Tillman, A., & Vogel, T. (2014). Integrating team-based design across the curriculum at a Large Public University. *Chemical Engineering Education*, 48(3), 139-148.

“Designing, Making, and Marketing Shower Gel: A Cross-curricular Activity” Henderson, J.A., Muskin, J., Greer, R. P., Bell, T.A., oral presentation at National Science Teacher Association Conference, March 2015.

“Engaging Under-Represented Students in STEM,” Henderson, J.A., Greer, R. P., Bell, T. A., oral presentation at Illinois Science Teacher Association Conference, October 2013.

Trenshaw, K., Henderson, J., Boyce, A., & DeStefano, L. (2012, October). Work in progress: Student outcomes of design projects across the curriculum. In *Frontiers in Education Conference (FIE)*, 2012 (pp. 1-2). IEEE.

“Balancing Roles as Evaluators and Educators. Roundtable presented at the meeting of the American Evaluation Association,” Trenshaw, K. J., Tillman, A. S., & Henderson, J. A., Minneapolis, MN, October 2012.

Kapoor, A., Zhang, J., Henderson, J. A., & Kenis, P. J. (2012). Protein Immobilization using Microfluidics: A Lab-on-a-Chip Experiment.

Lin, C., Kolossov, V. L., Tsvid, G., Trump, L., Henry, J. J., Henderson, J. A., & Timp, G. (2011). Imaging in real-time with FRET the redox response of tumorigenic cells to glutathione perturbations in a microscale flow. *Integrative Biology*, 3(3), 208-217.

“Study Skills & Habits for the Undergraduate Student, J.A. Henderson,” National Society of Black Engineers’ Fall Regional Conference (Region IV), November 2007 & 2008

“Electrochemical Platform to Modulate Intracellular Redox Environment” J.A. Henderson, M. Attene-Ramos, H.R. Gaskins, P.J.A. Kenis, oral presentation at the American Institute of Chemical Engineering Annual Conference, November 2007.

Invited Lectures

- University of Illinois, Graduate College: Summer Pre-doctoral Institute Fellows Talk, 2017
- University of Illinois, Undergraduate Minority Student Empowerment, 2017
- University of Houston, Study skills session for Black Excellence (BEST) Scholars, 2017

ACADEMIC SERVICE

University of Houston: Cullen College of Engineering

Director, Program for Mastery in Engineering Studies (PROMES), 2017-current

- Initiated and set goals for program according to the strategic objectives of the dean
- Restructured and executed student success program for 300 PROMES Scholars
- Secured corporate sponsorship, revamped and managed budget 200,000 per year
- Restructured PROMES Scholarship selection process
- Established PROMES assessment and program evaluation plan
- Led Program to one national award and the UH Board of Regents’ Academic Excellence Award
- Reestablished the PROMES Engineering Summer Camp for High School Students
- Oversaw 10 engineering/STEM student organizations

PROMES was formed in 1974 to promote engineering recruitment and retention among students from traditionally underrepresented groups. PROMES has helped thousands of students achieve their academic and career goals. PROMES’ efforts have an intentional design based upon research supported “Best Practices” for student success. PROMES cultivates scholars who achieve, connect, and trail blaze in all aspects of their lives.

Coordinator, National Action Council for Minorities in Engineering, 2016-present

- Recruited University of Houston scholars
- Planned and executed professional and academic development session for students
- Took students to annual BEYA conference in Washington DC (32 students in 2017, 50 students in 2018, and 64 in 2019). 60% of BEYA attendees landed full time, co-op or internship offers
- Maintain relationship with National Organization to continue funding for UH

Faculty Advisor, University of Houston- National Society of Black Engineers, 2016-present

Coached student chapter to two consecutive National Chapter of the Year Distinctions

Faculty Advisor, University of Houston- Triangle Fraternity, 2018-present

Cullen College of Engineering Dean’s Academic Advisory Board, 2017-present

Reviewer, University of Houston Graduate Research and Scholarship Projects, 2017

Mentor, Houston Early Research Experience, 2017

Guided freshmen and sophomore students through a research experience

Instructional Professor Search Committee, Cullen College of Engineering, 2016-present

University of Illinois: Chemical & Biomolecular Engineering (ChBE) Department

Faculty Advisor/Petition Advisor, 2010-2016

- Developed, interpreted & enforced departmental curricular policies
- Advised students on career, course sequencing, and being successful college students
- Approved or disapproved course articulations for credit from other universities (both US and abroad)

Awards & Scholarship Committee Chair, 2011-2016

- Enforced guidelines determined by donors for awarding departmental scholarships
- Guided committee in selecting awardees and executing yearly awards & scholarship ceremony

Curriculum Committee Member & Outcomes Assessment Committee Chair, 2011-2016

- Assessed effectiveness of departmental teaching and managed “closing the loop” on perceived teaching inefficiencies through semester evaluation of faculty
- Advised faculty on best practices for teaching and learning
- Presented results and directed departmental action (course or policy improvements) based upon stake-holder (e.g. alumni and graduating senior) surveys and exit interviews

Coordinator: Research Experience for Undergraduates (REU), 2009-2011

- Recruited underrepresented students to participate in NSF Funded Center for Nano-Scale Chemical-Electrical-Mechanical-Manufacturing Systems REU program each summer, increasing diversity by 65%
- Developed nanotechnology-based education modules for high school and middle school teachers (approximately 25-30 teachers per year)
- Supervised afterschool research projects of 6 high school students per semester

Founding Director, Douglass Cook Award for Entrepreneurship, College of Liberal Arts & Sciences, 2013-2014

- Developed award application, competition criteria, and competition rules
- Mentored students on proposals and presentations

Camp Coordinator, Girls Adventures in Mathematics, Engineering and Science, 2012-2016

- Co-authored student manual which includes classroom instruction, hands-on activities, demonstrations and team projects
- Facilitated week long exploration of chemical engineering for 24 high school aged girls

Search Committees

- Advisor for chemistry & chemical engineering students, Illinois, School of Chemical Sciences, 2012 & 2014

- Science teacher, Illinois, University Laboratory High School, 2012
- Director National Science Olympiad, Illinois, I-STEM, 2011
- Coordinator of Research Programs, Illinois, School of Chemical Sciences, 2007

PROFESSIONAL SERVICE

- National Science Foundation: ITEST Grant Mentor, 2018
- Paper reviewer: Creative Education - Scientific Research Publishing, 2018
- Proposal Reviewer: Science, Mathematics, & Research for Transformation (SMART), 2018
- Paper Reviewer: Community Engagement Division American Society of Engineering Education (ASEE) Annual Conference & Exposition, 2017-present
- National Science Foundation Proposal Reviewer: Broadening Participation in Engineering, 2016

SERVICE TO PUBLIC SCHOOLS

- St. Elmo Brady STEM Academy hosted at Burnet Elementary School, 2019-present
- St. Elmo Brady STEM Academy hosted at Blackshear Elementary School (in partnership with the University of Houston Third Ward Initiative), 2018- present
- Community Walk Volunteer, Blackshear Elementary School, 2018- present
- St. Elmo Brady STEM Academy hosted at University of Houston Charter School, 2017-present

Program Coordinator, Don Moyer Boys & Girls Club Science Club, 2007-2010

- Recruited 20 students to participate in Benjamin Banneker Science Club each semester
- Participated in grant writing – successfully obtained 3 years of funding (\$90,000)
- Coordinated field trips & experiments for underrepresented 4th- 6th grade students
- Taught students scientific principles through hands on science laboratory experiments

AWARDS

- Regent's Academic Excellence Award, 2018
- INSIGHT Into Diversity magazine's 2018 Inspiring STEM Programs, 2018
- INSIGHT Into Diversity magazine's 2017 Inspiring Leaders in STEM Award, 2017
- Campus Award for Excellence in Public Engagement, 2015
- University of Illinois Public Engagement Grant Recipient, 2014
- NAACP "Yes We Can Education Award" (A& O Development Corporation), 2014
- Most Supportive Faculty Member, Recognized by Bruce Nesbitt African American Culture Program, 2013
- NASA Harriet G. Jenkins Fellowship Recipient, 2004-2007
- SURGE Fellowship Program Fellowship Recipient, University of Illinois, 2003-2007
- Phi Beta Kappa Society, Delta of Georgia, Atlanta, GA 2001

PROFESSIONAL MEMBERSHIPS

- American Society for Engineering Education
- American Educational Research Association
- National Society of Black Engineers

- American Institute for Chemical Engineers
- American Chemical Society

COMMUNITY SERVICE

- **Board of Directors**, A & O Development Corporation, 2013-2016
- **Board of Trustee Member**, The Center for Educational Research and Practice, 2011-2016
- **Guest lecturer**, Centennial High School, Champaign, IL, 2007
- **Mentor**, Champaign County 1 to 1 Mentoring Program, 2006-2016