

**Shakira Renee Hobbs, Ph.D.**

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*website: shakirahobbs.com*

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**CAREER SNAPSHOT**

- Founded BioGals, a non-profit that empowers womxn around the world to bring their ideas to life and engineer dynamic solutions for sustainable development
  - Received NIH rapid grant (~\$48K) to support wastewater assessment of coronavirus in Kentucky
  - Received over ~\$330K in research grants since 2019
  - Published 6 peer-reviewed journal articles; 7 peer-reviewed conference proceedings
  - Advise 2 graduate (1 PhD and 1 MS) & graduated 1 MS student
  - Developed two new classes on sustainable and humanitarian engineering
  - International research appointments at MIT and a high school in Trinidad & Tobago
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**EDUCATION**

**Ph.D. in Civil Engineering**

Clemson University, Clemson, South Carolina

NSF IGERT-SUN Fellow

EREF Fellow

Dissertation: "Strategic Sustainability Assessment of Enhanced Anaerobic Digestion of Food and Bioplastic Waste for Municipalities"

Thesis advisor Dr. Amy E. Landis

**M.S. in Engineering (Environmental)**

Arizona State University, Meza, Arizona

Dissertation: "Maximizing the Production of Biogas in an Instructional Manipulative Designed to Teach Energy Concepts to High School Students"

Thesis advisor Dr. Odesma O. Dalrymple

**B.S. in Environmental Science and Technology**

University of Maryland, College Park, Maryland

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**APPOINTMENTS**

*Assistant Professor*

*University of Kentucky*

*February 2019-present*

*Department of Civil Engineering*

*Research Associate*

*University of Virginia*

*July 2017-2019*

*Department of Civil and Environmental Engineering*

*Research the advancement of renewable energy technologies*

*Utilize engineering behavior science techniques to understand user adoption and utilization*

## Curriculum Vitae 2020

*of waste to energy technologies.*

*Doctoral Graduate Research Assistant      Clemson University      August 2015-August 2017*  
*Glenn Department of Civil Engineering*

*Researched ways to optimize the end use treatment of biobased waste from various methodologies such as pretreatment and life-cycle assessment for evaluating environmental impacts*

*Developed novel tools and systems to evaluate technologies that convert food waste to resources such as bioenergy*

*Developed experiments using Biochemical Methane Potential Assays (BMPs) assessing the performance of food waste and bioplastic via anaerobic digestion*

*Worked with a rural developing country assessing the viability of anaerobic digestion to provide fuel to cook school lunches*

*Doctoral Graduate Research Assistant      Arizona State University      2014-2015*  
*School of Sustainable Engineering and the Built Environment*

*Researched and focused on innovative solutions for converting food waste and bioplastic to valuable resources*

*Relocated with advisor to Clemson University in 2015*

*Graduate Instructor      Massachusetts Institute of Technology      Summer 2015*  
*5<sup>th</sup> Rowe Leadership Programme at Singapore University of Technology and Design*

*Master's Graduate Research Assistant      Arizona State University      2012-2014*  
*College of Innovation and Technology*

*Took a multidisciplinary approach to optimizing plug-flow anaerobic digester and development of instructional manipulative for engineering education*

*Built anaerobic digester through design of experiments to optimize design for classroom and teaching use*

*Researched and evaluated practicality of alternative energy curriculum in Arizona and Trinidad & Tobago*

*Undergraduate Research      University of Maryland      2007-2012*  
*Louis Stokes Alliance Minority Program (LSAMP)*

*Researched and developed alternative energy model for farmers located in northern regions of the U.S. seeking to use active solar thermal systems for operating greenhouses with USDA-SARE*

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### **REFEREED PUBLICATIONS (6)**

Dixon, Phillip, James Mihelcic, Sarina Ergas, **Shakira R. Hobbs**. (2019). "Effect of Substrate to Inoculum Ratio on Bioenergy Recovery from Food Waste, Yard Waste and Biosolids via High Solids Anaerobic Digestion." *Environmental Engineering Science* 36 (12), 1459-1465. <https://doi.org/10.1089/ees.2019.0078>

**Hobbs, Shakira R.**, Bethany Gordon, Evvan V. Morton, Leidy Klotz. (2019). "Black women engineers as allies in adoption of environmental technology: Evidence from a developing community in Belize." *Environmental Engineering Science* 36 (8), 851-862. <https://doi.org/10.1089/ees.2018.0463>

**Hobbs, Shakira R.**, Prathap Parameswaran, Barbara Astmann, Jay Devkota, Amy Landis.

## Curriculum Vitae 2020

(2019). "Anaerobic co-digestion of food waste and polylactic acid: Effect of pretreatment on methane yield and solid reduction." *Advances in Material Science and Engineering*, 2019, 1-6. <https://doi.org/10.1155/2019/4715904>.

**Hobbs, Shakira R.**, Amy E. Landis, Bruce E. Rittmann, Michelle Young and Prathap Parameswaran. (2018). "Enhancing Anaerobic Digestion of food waste through Biochemical Methane Potential Assays at different substrate: inoculum ratios." *Waste Management*, 71, 612-617. <https://doi.org/10.1016/j.wasman.2017.06.029>

**Hobbs, Shakira R.**, Evvan E. Morton, Nicole Barclay, Amy E. Landis. (2018). "Sustainability Approach: Food waste to energy solutions for small rural developing communities." *International Journal of Environmental, Cultural, Economic, and Social Sustainability: Annual Review*. 13 (1) 21-37. <https://doi.org/10.18848/1832-2077/CGP/v13i01/21-37>

Unger, Scott R., Troy A. Hottle, **Shakira R. Hobbs**, Cassandra L. Thiel, Nicole Campion, Melissa M. Bilec, Amy E. Landis. (2017). "Do single-use medical devices containing biopolymer reduce the environmental impacts of surgical procedures compared with their plastic equivalents?" *Journal of Health Services Research and Policy*. 22 (4), 218-225. <https://doi.org/10.1177/1355819617705683>

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### REFEREED CONFERENCE PROCEEDINGS (7)

Astmann, Barbara, Pedro Martin, and **Shakira R. Hobbs**. (2020). "Monitoring and Modeling Glyphosate Transport in the Belize River Watershed." 2020 IEEE Global Humanitarian Technology Conference. October 29-November 1, 2020 Seattle, WA.

Morton, Evvan V. and **Shakira R. Hobbs**. (2018). "Sustainable Waste Management Strategies for Sittee River, Belize." 7th International Symposium on Energy from Biomass and Waste, October 15-18, 2018 Venice, ITL.

**Hobbs, Shakira R.**, Tyler Harris, William J. Barr and Amy E. Landis. (2018) "The World's Environmental Problems: Causes, Effects and Solutions of Food and Plastic Pollution." American Academy of Sciences. International Conference on Environmental Science and Technology, June 25-29, 2018 Houston, TX.

**Hobbs, Shakira R.**, Jay Devkota, Prathap Parameswaran, and Amy E. Landis. (2016). "Environmental Implications of Food and PLA Waste Management Options." American Academy of Sciences. International Conference on Environmental Science and Technology, June 6-10, 2016 Houston, TX.

**\*\*Hobbs, Shakira R.**, Prathap Parameswaran, Barbara A. Astmann, Jay Devkota, and Amy E. Landis. (2016). "Enhanced anaerobic digestion of bioplastic and food waste." International Waste Working Group, 6<sup>th</sup> International Symposium on Energy from Biomass and Waste, November 14-17, 2016 Venice, ITL.

**\*McCall, Shakira R.**, and Odesma O. Dalrymple. (2015). "Research to Practice: Teaching Energy Concepts using Chain Reaction Machines". 121<sup>st</sup> ASEE Annual Conference & Exposition. American Society of Engineering Education, June 15-18, 2015, Indianapolis, IN.

**\*McCall, Shakira R.**, and Odesma O. Dalrymple. (2015). "Curriculum-Exchange: Teaching Energy Concepts using Chain Reaction Machines". 121<sup>st</sup> ASEE Annual Conference & Exposition. American Society of Engineering Education, June 15-18, 2015, Indianapolis, IN.

\*Last name formerly McCall

\*\*Selected for Journal Publication

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**SELECTED OTHER PRESENTATIONS: POSTERS (4)**

**Hobbs, Shakira R.**, Rider Foley, Jameson Wetmore, Amy Landis, Matthew Harsh, and Thomas Woodson. (2018). "Enabling Engineering Projects through Community Engagement: A Workshop Approach." Workshop: Ethics and Responsible Innovation in STEM, March 14-15, 2018 Raleigh, NC.

**Hobbs, Shakira R.**, Evvan E. Morton, Amy E. Landis (2016). "Renewable Energy Production Strategies for Promoting Environmental and Social Sustainability for Sittee River Belize." 2<sup>nd</sup> 2016 Academic Research and Leadership Network Symposium, March 23-27, 2016, Boston, MA.

**Hobbs, Shakira R.** and Amy E. Landis (2015). "Feasibility Study of Food waste and Bioplastic to Energy". 88<sup>th</sup> Annual Conference & Exhibition. AZ Water Association, May 6-8, 2015 Glendale, AZ.

**Hobbs, Shakira R.** and Odesma O. Dalrymple. (2014). "Experimental Design to Improve Biogas Production from Cow Manure". Innovation Showcase. Arizona State University, April 29, 2014 Mesa, AZ.

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**GRANTS AWARDED**

I was responsible for the idea development and led or contributed to the writing of the following grants:

***Co-PI-Shakira R. Hobbs: UK-CURE COVID-19 Pilot Program Grant UL1TR001998 NIH,*** "WACKY: Wastewater Assessment for Coronavirus in Kentucky."

**\$48,488** (July 2020-present)

***PI-Shakira R. Hobbs: UK-CARES Grant P30 ES026529 NIEHS,*** "Estimation of Watershed Glyphosate Exports in Karst Landscapes."

**\$15,202** (February 2020-April 2020)

***PI-Shakira R. Hobbs: Vice President of Research 2019 Equipment Grant,*** "Acquisition of a LC-MS/MS dedicated to environmental engineering research."

**\$269,501**

***PI-Shakira R. Hobbs: NSF-IGERT: SUN Competitive Innovation Fund,*** "Sustainable Energy Recovery from Waste for Sittee River, Belize."

**\$14,690** (December 2017-December 2018)

***PI-Amy E. Landis: NSF CBET,*** "Evaluating Sustainable Disposal Options for Compostable Biopolymers." Graduate Student Preparedness Supplement

**\$10,000** (June 2016-June 2017)

***PI-Amy E. Landis: NSF CBET,*** "Evaluating Sustainable Disposal Options for Compostable Biopolymers." Research Experience for Undergraduate Supplement

**\$10,000** (July 2016-July 2017)

***PI-Shakira R. Hobbs: NSF-IGERT: SUN Competitive Innovation Fund,*** "Sustainable Energy Recovery from Waste for Sittee River, Belize."

**\$8,000** (March 2015-August 2016)

## GRANT WRITING EXPERIENCES

I was responsible for the idea development and led the writing of the following grants:

***PI-Shakira R. Hobbs: Elsevier Foundation Green & Sustainable Chemistry Challenge,***  
“Sustainable Energy Recover from Waste for Sittee River, Belize.”

Semi-finalist

**\$49,505**

***PI-Amy E. Landis: NSF SEES-INFEWS,*** Food, Energy and Water Supplement to Landis CBET award and Torres CBET award.”

**\$70,000**

**\$277,438**

***PI-Amy E. Landis: EREF,*** “Strategic Solutions for Cities and Institutions of Sustainability Manage Organic Waste Diversion.”

**\$316,004**

***PI-Amy E. Landis: NSF-CBET,*** “SWARM–the Sustainable Waste Reduction Algorithm- A Model Evaluating Food and Bioplastic Waste to Valuable Products.”

**\$316,000**

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## Invited Talks

“To Be Young, Gifted And Black: Open Your Heart To What I Mean” University of San Diego, San Diego, California, September 10, 2020

“Understanding the Value in Waste to Make a Global Impact” University of California, Berkeley, Berkeley, California, January 31, 2020

“Optimizing End-Use Application of Bioplastics and Food Waste by Recovering VFAs” United States Department of Agriculture–Agriculture Research Service Albany, California, January 30, 2020.

“Application of Sustainable Engineering for the Global Village” Syracuse University. Syracuse, New York, February 8, 2019.

“Novel Approaches to the Food-Energy-Water Nexus Challenges” University of Missouri. Columbia, Missouri, November 30, 2018.

“Addressing Humanitarian and Global Issues at the Food-Energy-Water Nexus” University of Kentucky. Lexington, Kentucky, November 19, 2018.

“Engage First, Engineer Together” Clemson University. Clemson, South Carolina, October 5, 2018.

“Biodigesters, Belize, and Black Women Engineers: The intersection of knowledge and global partnership” University of South Florida. Tampa, FL, April 13, 2018

“Waste to Energy: A Systems Approach to Managing Bioplastics and Food Waste.” University of Virginia. Charlottesville, VA, March 2, 2018

“What to do with them: Food waste and Bioplastics.” Rochester Institute of Technology. Rochester, NY, June 2, 2017

“Innovative Waste Techniques for Food waste and Bioplastics.” Wayne State University. Detroit, MI, May 31, 2017

“Waste to resources: capturing methane production for fuel and aggregates for soil amendments.” University of Southern California. Los Angeles, CA, April 20, 2017

## Curriculum Vitae 2020

“Sustainable Food Waste and Bioplastic to Energy Resources.” North Dakota State University.  
Fargo, ND, March 23, 2017

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### SELECTED ORAL PRESENTATIONS

- Astmann, B., and **Shakira R. Hobbs**. “Evaluating Soil & Water Assessment Tool (SWAT) Capabilities to: Simulate Glyphosate Transport on a Watershed Scale”, Oral Presentation, Society of Environmental Toxicology and Chemistry 40<sup>th</sup> Annual Meeting, Toronto, Canada November 3-7, 2019.
- Evvan V. Morton and **Shakira R. Hobbs** (2018). “Sustainable Waste Management Strategies for Sittee River, Belize.” October 16, 2018. Oral. 7th International Symposium on Energy from Biomass and Waste, Venice, IITL
- Shakira R. Hobbs** (2017). “Food Waste and Bioplastics Management to Increase Sustainability.” EREF Summit on Organics. Ontario, CA, July 25-27, 2017
- Evvan V. Morton, Nicole Barclay, Amy E. Landis, **Shakira R. Hobbs** (2017). “Waste Management Strategies for Sittee River, Belize.” 2017 Joint Conference International Society for Industrial Ecology-International Symposium on Sustainable Systems and Technology. Chicago, IL, June 25-29, 2017
- Amy E. Landis, Jay Devkota, Pragnya L. Eranki, and **Shakira R. Hobbs** (2017). “Water Quality: The Often Ignored Consequences of Emerging Technologies.” Engineering Sustainability 2017. Pittsburgh, PA, April 9-11, 2017
- Shakira R. Hobbs** and Amy E. Landis (2016). “[Methane Recovery from the Anaerobic Digestion of Food and Pretreated Bioplastic Waste.](#)” 20th Annual Green Chemistry & Engineering Conference. American Chemical Society. Portland, OR, June 14-16, 2016
- Shakira R. Hobbs**, and Amy E. Landis (2015). “Anthropogenic Waste to Energy: Food Waste and Bioplastic as Renewable Energy Sources.” National Society of Black Engineers (NSBE) 41<sup>st</sup> Annual Convention. Anaheim, California. March 25-28, 2016
- Shakira R. McCall** and Odesma O. Dalrymple (2014). “Optimizing Plug-flow Anaerobic Digesters to teach K-12 Basic Processes of Anaerobic Digestion. Environmental Professional of Arizona. 10<sup>th</sup> Annual Gatekeeper Regulatory Roundup. Tempe, AZ. February 11-12, 2014
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### HONORS, AWARDS, FELLOWSHIPS, AND APPEARANCES IN POPULAR MEDIA

- WKYT Lexington, Kentucky, “[UK Researchers Working on Study to See How COV-19 Virus Survives in Water](#)” (2020)
- WKYT Lexington, Kentucky “[Researchers: Testing Sewage could detect COVID-19 early](#)” (2020)
- “[Biodegradable.](#)” a Magic Word for Environmentally-Minded Consumers, Isn’t Always a Green Panacea” *FairWarning* (2020)
- “[Humanitarian Engineering with Shakira Hobbs](#)” *UKY College of Engineering* (2019)
- “[Our Journey with BioGals-Creating a Non-Profit to Build Waste to Energy Systems in Central America](#)” *Earth Shift Global* (2019)
- “[From Biowaste to Biogas: Empowering this community to Fuel itself](#)” *UVA Today* (2019)
- “[A sense of belonging: Black American women engineers and biodigesters](#)” *Stabroek News* (2018)

## Curriculum Vitae 2020

["Today's STEM Leaders, Tomorrow's Innovators"](#) *Women of Color Magazine Volume 16 Issue 1* (2017)

[Environmental Research & Education Foundation Scholarship](#) (2016 -2017)

[Ford Foundation Fellowship Dissertation Competition Honorable Mention](#) (2016)

Water Association 88<sup>th</sup> Annual Conference; 3<sup>rd</sup> Place Presentation Awardee (2015)

National Science Foundation IGERT Fellow (2014-2015)

Dean's Graduate Award for Academic Excellence (2014)

ASU Graduate Educational Doctoral Enrichment Fellowship Awardee (2014)

ASU JumpStart Research Grant Awardee (2014)

More Graduate Education @ Mountain State Alliance Scholar (2012-2014)

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### UNIVERSITY INITIATIVES AND LEADERSHIP

[Faculty and Graduate Women Communicating Science](#), Clemson Univ. 2017

*Coordinated campus-wide workshop focused on unique challenges women face in STEM in collaboration with Stony Brook University Alan Alda Center for communicating science.*

[President of Black Graduate Student Association](#), Clemson Univ. 2016-2017

*Coordinated campus-wide interdisciplinary, education and outreach programs that promotes upward mobility and empowers students to excel academically*

[Graduate Professional Development Coordination](#), Clemson Unvi. 2016-2017

*Coordinated workshop and programs to support graduate student professional development in the form of grant writing (pilot 15 grad students submitted NSF Supplements for over \$110K), communication, and diversity.*

[REU Supplement Consortium](#), Clemson Univ. 2016

*Developed a program to increase REU student research by securing Supplements to faculty NSF awards. Prepared templates for ease of Supplement submission. Collaborated with PEER and WISE to target underrepresented students.*

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### TEACHING EXPERIENCES

#### ***University of Kentucky: (Instructor for 1 course)***

Sustainable Development Engineering: CE 599 (Spring 2020 & Fall 2020)

Developed course focused on bridging the gap between appropriate technology, policy, and practice of international sustainable development. The following topic were addressed: water, sanitation, financing, policies, project monitoring, the impact of economics and politics, project management, and monitoring and evaluation.

Introduction to Humanitarian Engineering: CE 599 (Fall 2019)

Developed course focused on humanitarian and sustainable engineering solutions and technology to control pathogens and other environmental pollutants found in a developing world setting and smaller communities in North America. Concepts of sustainable development are covered. Topics are drawn from several areas of engineering, including water supply, water treatment, water storage, wastewater treatment, materials, solid waste management, construction, and watersheds.

## Curriculum Vitae 2019

### ***University of Virginia: (Instructor for 1 course)***

Introduction to Environmental Engineering: CE 2100 (Fall 2018)

Developed course focused on society's interactions with water, air and soil systems. Management of these major environmental components are examined, considering health and ecological needs as well as social and technical limitations.

### ***Clemson University: (Teacher's Assistant for 1 courses)***

Creative Inquiry: CE 3990 Applications of Sustainability (Fall 2016)

Developed new course teaching advanced concepts of sustainability and challenges that precludes sustainability. This course is project based with an emphasis on novel cutting edge research.

### ***Arizona State University: (Teacher's Assistant for 2 courses)***

Make Your Ideas Happen EGR 201 (Fall 2014)

Taught individual tutorials on rapid prototyping equipment, materials testing equipment and electronic instrumentation

Critical Inquiry in Engineering EGR 104 (Spring 2013)

Taught systematic evaluations of information as input to decision making  
Assisted over 40 students in creating innovative technological solutions to end human trafficking  
Selected to evaluate and recommend student led project teams to University's Innovation Showcase

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## **MASTER'S AND DOCTORAL THESES UNDER DIRECTION**

### **Ph.D. Thesis:**

Pedro Martin (Ph.D., Expected Graduation Date: May 2023)

### **M.S. Thesis:**

Barbara Astmann (M.S., Graduation Date: August 2020)

Dennis Newby (M.S., Expected Graduation Date: May 2021)

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## **SERVICE**

### **University of Kentucky:**

College of Engineering Diversity and Inclusion committee member (present)  
Department of Civil Engineering research committee member (present)  
Developed engineering activity for Women in Engineering Camp for UK (2019)

### **University of Virginia:**

UVA Alumni reunion panelist (2018)  
Mentor for graduate students (2017-2019)  
GEM Grad Lab panelist (2017)

### **Clemson University:**

Call Me Doctor and STEM All-In panelist (2018)  
Mentor for undergraduate researchers (2015-2017)  
CURE: Clemson University Research Experience mentor (2016)



**Arizona State University:**

Mentor for undergraduate researcher (2015)  
Organized alternative energy curriculum for STEAM Machine Camp (2013-2014)  
K-12 Engineering Open House volunteer for ASU (2014)

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**PEER REVIEW SERVICE**

*Journal of the Air & Waste Management Association*; manuscript review (2019)  
*National Science Foundation* (2018, 2019, 2020)  
*Applied Energy*; manuscript review (2017)  
*International Journal of Environmental Sustainability*; manuscript review (2017)  
ASEE Conference; abstract and conference proceedings reviews (2014)

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**PROFESSIONAL DEVELOPMENT**

***National Society of Black Engineers Member*** (2009-present)  
Regional Membership Chair, (2011-2012)  
Chapter President, (2010-2011)

***BioGals*** (2018-present)

Co-Founder and CEO of [BioGals](#), a non-profit organization dedicated to empowering Womxn of Color around the world to bring their ideas to life, engineer dynamic solutions for sustainable development, and establish a legacy of changemakers who embody cultural diversity.

***Clemson University Black Graduate Student Association***  
President (2016-2017)

***Shades Multicultural Peer Mentoring*** (2014-2015)  
Mentor, Arizona State University

***University of Maryland Solar Decathlon*** (2009-2011)  
Team member

***Academic Research and Leadership Network***

***American Chemical Society***

***American Society of Engineering Education***

***Association of Environmental & Science Professors***

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**PROFESSIONAL ACTIVITIES**

NSF CAREER Workshop Virtual due to COVID-19 (March 2020)  
DOE Plastic for a Circular Economy Workshop at Golden, Colorado (December 2019)  
NSF Minority Faculty Development Workshop at Harvard University (September 2019)  
LATTICE-Symposium for Early Career URM women in Engineering (June 2019)  
Intergenerational Mentoring Workshop (June 2019)  
NextProf Future Faculty Program at University of California Berkeley (September 2018)  
Microalgae Process Design Course at Wageningen University (July 2015)