

WOMEN

IN ENGINEERING PROGRAM

NATION'S FIRST
WOMEN
IN ENGINEERING PROGRAM



DREAM IT. DESIGN IT.
BUILD IT. CREATE IT.
THAT'S WHAT
**PURDUE
ENGINEERING**
IS ALL ABOUT.

**MAKE
YOUR MARK**





#be_aWE50me

Photos were taken during the Women in Engineering Program 50th anniversary weekend.



MISSION AND OBJECTIVES

Since 1969, Purdue's Women in Engineering Program has been committed to increasing the recruitment, retention, and graduation of women engineering students. Each year, we reach out to support and inform more than 4,000 girls and young women - from elementary school through graduate school.

MISSION:

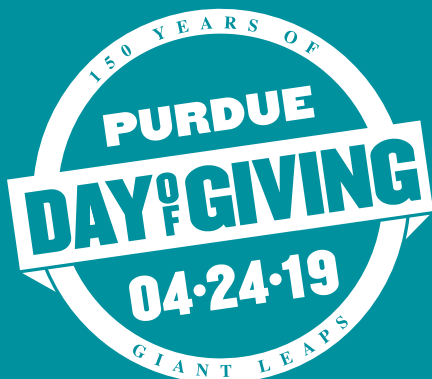
The Women in Engineering Program at Purdue University is dedicated to enriching the profession of engineering through the full participation of women. We develop and direct activities that provide:

- encouragement for girls and young women to study engineering
- information about careers and companies, and
- an environment conducive to the successful completion of students' studies.

We also strive to maintain strong relationships with alumnae, friends, corporations, and foundations who generously support our program.

OBJECTIVES:

- To provide career information and encouragement to pre-college girls and young women to continue achievement in math and science and consider engineering as an appropriate career choice.
- Encourage women to matriculate at Purdue University in the College of Engineering.
- Ensure a climate in the College of Engineering that allows young women to reach their full potential.
- Provide opportunities for women engineering students to develop leadership skills that can be utilized in their future lives.
- Encourage women to consider graduate education and academia among their options upon graduation.
- Maintain open communication with alumnae and their employers to encourage their continued participation in and support of the Women in Engineering Program.



WIEP could not achieve its mission to enrich the profession of engineering through the full participation of women without the generous support of our donors. We are taking part in **Purdue Day of Giving on April 24, 2019**. This 24-hour event is an exciting endeavor where the Purdue community comes together to support higher education at the highest proven value. It is made possible both by the generosity of our alumni and friends and by the commitment of our faculty, staff, and students. If you would like to make a contribution to WIEP on April 24, please go to dayofgiving.purdue.edu or contact Hadley Thomas at 765.496.6035 or hbthomas@prf.org

CHANGE THE CONVERSATION

How to Encourage a Child's Interest in Engineering

A question we hear quite often in the Women in Engineering Program office is how can I encourage a child's (my child's) interest in engineering, or STEM more broadly? Several of our outreach programs have a parent specific component so that we can address this more fully. For those of you wondering about this topic, and can't come to our programs, here are some tips:

1. Stop focusing on the "inputs" to an engineering degree. Instead focus on the "outputs."
2. Know that many girls lose interest in math and science between 4th and 8th grades.
3. Remember that the expectations that society has for engineers show a great overlap with the expectation that society has for boys, and not so much with the expectations that society has for girls.
4. Know career motivators for girls.
5. Try to find positive female role models in engineering.



01

Stop focusing on the “inputs” to an engineering degree. Instead, focus on the “outputs.” Inputs are things like being really good at math and science, and maybe problem solving. Outputs are the things you get to do as an engineer, and the impact you can have on people’s lives, in both big and small ways.

Contrast how you talk about engineering to how you might talk about becoming a doctor. You probably wouldn’t say that if your child was really good at anatomy and physiology and chemistry that they should be a doctor. You might talk about how doctors save lives and help people live longer and healthier.

02

Know that many girls lose interest in math and science between 4th and 8th grades. Look for a loss of interest, talk to them about how their friends react to their interest, and how their teachers are (or are not) encouraging. Think about how you attribute success in those classes.

Research shows that in general, more parents attribute their daughters’ success in math and science to “hard work” and their sons’ successes to “talent.” It’s a subtle but important difference.

03

Remember that the expectations that society has for engineers (i.e. do well in math, be a leader, focus on tasks and problem-solving, don’t be emotional) show a great overlap with the expectations that society has for boys, and not so much with the expectations that society has for girls (i.e. have superior verbal skills, be nurturing/caring, have high emotional intelligence).

This leads ALL of us - parents, relatives, peers, teachers, guidance counselors - to unconsciously encourage boys more than girls towards engineering. Be intentional about your encouragement and talk about how engineering intersects with her current interests - because engineers are involved with everything!

04

Know the career motivators for girls. Research shows that these are the things that teenage girls both intentionally and subconsciously think about when choosing a future path.

Here is what girls want in a future career:

- Enjoy what they do
- Good working environment
- Make a difference
- Good income
- Flexibility

Here’s what they say they hear about engineering - note that these don’t address career motivators:

- It’s a challenging profession
- Go for it! It’s difficult but rewarding.
- Use math and science to solve problems.

05

Try to find positive role models in engineering. Some helpful resources:

The Design Squad parents and educators website:
<https://pbskids.org/designsquad/parentseducators/index.html>

The Engineer Girl website:
<https://www.engineergirl.org>

PROGRAM FEATURE - INNOVATION TO REALITY (I2R)

Innovation to Reality (I2R), is entering its 10th year, working to replace the often false stereotypes of engineering by exposing the students to a positive, creative and thoughtful experience.

Innovation to Reality (I2R) is a free evening outreach program developed by WIEP that provides middle school students the opportunity to learn about engineering through 4 weekly themed sessions, each of which is 2 hours. This outreach program, entering its 10th year, works to replace the often-false stereotypes of engineering by exposing the students to a positive, creative, and thoughtful experience using relevant engineering disciplines to solve real-world problems.

The mission of I2R is to positively influence interest in engineering through:

- Introducing students early to engineering.
- Relating the career of an engineer to solving problems that impact people.
- Providing an accurate depiction of what engineers actually do.

WIEP has partnered with the Purdue EPICS program to form a team dedicated solely to 'outreach in engineering' whose defined outcome is to develop and implement an entire session of I2R. WIEP Assistant Director, Sue Bayley, serves as the advisor to the EPICS team as they:

- Work their way through the EPICS design process to choose a theme for the sessions.
- Develop hands-on engineering activities.
- Line up professors and student groups to give presentations.
- Plan lab tours for the middle school students.

The team delivers its I2R 'design' within 12 weeks of beginning the process. Members of the team lead each of the 4 sessions, giving them the practical experience in delivering a design. The mission of I2R also affords the EPICS students valuable knowledge regarding the mission of WIEP and how to break down stereotypes and negate biases they might encounter in their own lives and professional career.



EPICS®



ALUMNAE FEATURE



Dr. Oluwareyi (Shay) Ogebule

Education

PhD Chemical Engineering
Purdue University, 2013

Current Positions

Vice President and Co-Founder of the Joule Foundation
IoT Strategic Roadmap Portfolio Manager, Intel Corporation

Dr. Mopelola (Mope) Akande

Education

PhD Electrical and Computer Engineering
Purdue University, 2013

Current Positions

Vice President and Co-Founder Joule Foundation
Technical Writer (Statistics and Machine Learning), MathWorks



Dr. Alinda Mashiku

Education

PhD Aeronautical and Astronautical Engineering
Purdue University, 2013

Current Positions

President and Co-Founder of the Joule Foundation
Aerospace Engineer at NASA



The Joule Foundation

To learn more about The Joule Foundation, visit our website at www.joulefoundation.org or find us on social media using our handle @joulefoundation. We are also looking for volunteers to work with us in our various committees. No prior experience is needed, just your commitment and willingness to make a difference. If you are interested in joining us, or if you have further questions, please e-mail us at joulefoundation@gmail.com.

ALUMNAE FEATURE

Why did you choose to attend Purdue?

Why did you choose to attend Purdue?

Shay: I participated in a Summer Undergraduate Research Internship at Purdue. My experience in the summer program and the exceptional caliber of the Chemical Engineering program led to my decision to pursue a PhD at Purdue.

Mope: I participated in a Summer Undergraduate Internship at Purdue and was impressed by the quality of the research work conducted by the students and faculty in the Electrical and Computer Engineering (ECE) department. I also really liked the atmosphere of the Purdue campus and was eager to return.

Alinda: Purdue University is known around the world as the “Cradle of Astronauts;” that was a no brainer for me. It spoke to the quality of the University and the School of Aeronautics and Astronautics that sent men and women into space. When I visited the department in the summer before the academic year began, the professors and staff made me feel welcome and at home. I knew it was the right decision for me.

How were you involved with WIEP when you were on campus?

Shay: I was very active in the Graduate Mentoring Program (GMP) - I hardly missed any monthly meetings. In my last 2 years at Purdue, I was part of the GMP Leadership Team. I consider it an important part of my Purdue experience as it gave me the safe space to hone my leadership skills and prepared me for a career in industry.

Mope: I attended the monthly GMP meetings where I got the opportunity to network with women from various departments and to learn from speakers and mentors. Also, as a GMP ambassador for the ECE department, I organized networking and social events for my colleagues in that department.

Alinda: GMP held their monthly meetings in Armstrong Hall. All I had to do was take a few flights of stairs to one of the classrooms near Amelia's Cafe. Our department's GMP group was also very active, I got the chance to meet other women in my department who worked at Zucrow Labs and develop a camaraderie that helped pull us through our graduate studies and just life in general.



Did your involvement with the Women in Engineering Program impact your Purdue experience?

Did your involvement with WIEP impact your Purdue experience?

Shay: Absolutely - besides being a reason to take a break from research, it offered networking opportunities that allowed me to interact with other grad students and excellent guest speakers. In addition, I was intrigued by WIEP's outreach programs, especially Introduce a Girl to Engineering Day (IGED). This served as one of my inspirations for The Joule Foundation to introduce STEM hands-on activities to girls around the world.

Mope: It sure did! It was very encouraging for me to rub minds with other women who were dealing with the challenges that come with completing a PhD program. I formed friendships that helped me keep my head up during the challenging times in my program. Also, the monthly meetings were a welcome break from research, and they were an opportunity to glean nuggets of wisdom from guest speakers.

Alinda: Graduate research can sometimes feel like a lonely journey. I had great professors who really believed in me and had high expectations. Every once in awhile - you doubt yourself - no matter what gender or race you are. Having the opportunity to mingle and encourage one another as female graduate students was always an encouraging and welcomed light of hope. We always celebrated the successful dissertation defenses of our peers and friends, and that always seemed to light that fire of determination to ensure that we succeeded - together.

How did your relationship with each other come about?

Shay: I met Mope during an undergrad summer internship at Purdue. We both returned to Purdue for our PhDs. I met Alinda during a monthly meeting held by WIEP GMP.

Mope: Alinda and I took an ECE course together and also attended the same church in Lafayette. I met Shay during my summer research internship at Purdue. Our friendships are based on more than academics, as we have a lot more in common; this speaks to the fact that we are still good friends today.

ALUMNAE FEATURE

How did your relationship with each other come about?

Alinda: I met Mope at a local church in Lafayette, Indiana, and we took a class together in grad school. Shay and I met at one of the WIEP GMP meetings. I also attended Chi Alpha Christian fellowship on campus where I would regularly run into Shay and Mope.

How did the idea of forming the Joule Foundation come about?

How did the idea of forming the Joule Foundation come about?

Shay: A few years after we graduated from Purdue, sometime in early 2015, Alinda reached out to Mope and me about the idea for the Joule Foundation. At the time, she had an idea to give back to African schools through a scholarship program for girls. As we had all graduated from high schools in different African nations, we were very excited about the initiative. I immediately remembered a discussion that I had previously held with Dr. Jennifer Groh (former WIEP Associate Director) about an initiative for workshops similar to IGED, and I pitched it that we could include a similar workshop component in our scholarship program. Mope had also worked for years as a teaching assistant in the EPICS program at Purdue's College of Engineering, and she was confident that her experience would be valuable for creating workshops that would be "relevant" to the African students. Just like that, we began to meet weekly over video conference to develop our ideas for the foundation. While running the Joule Foundation, we all still hold our full-time jobs in industry. Our initial Board of Directors was comprised of Purdue Alumni: Dr. Sheran Oradu (Chemistry), Dr. DeLean Tolbert (Engineering Education), Amadin Osagiede (Business School), and Fabiola Rojas (Business School). Our team is growing, and we feel blessed to have this platform for promoting STEM education among African girls.

What is the mission of the Foundation?

Shay: Our mission is to promote STEM education among young African women through academic programs. Having the opportunity to encourage African school girls to dream big and go for academic pursuits in areas where they are already strong, is a crucible for change and advancing the society and the world.

How has your Purdue degree helped you?

Shay: It has given me the boldness to take on new initiatives without wavering. It has also inspired African girls to follow suit - to even consider a degree in Engineering.

Mope: I share these same sentiments as my friends. Apart from our Purdue degrees, we also gained a strong network of professionals, academics, researchers; you name it, that we can regularly consult as we work towards accomplishing our mission.

Alinda: I remember when Purdue introduced the motto "Purdue: Makers All," and they would talk about all the vastly different and impactful endeavors that Purdue Alumni and current students were doing, to change the world. I agree with Shay, "It gave us the boldness to take on new initiatives without wavering." We do it all! Whatever we set our minds to, we do it and we do it well!

What advice do you have for young women who are studying engineering?

What advice do you have for young women who are studying engineering?

Shay: Mentor and be mentored! We all play a role in paying it forward to the next generation. Surround yourself with people that will push you forward and do the same for others.

Mope: First, kudos to you for taking on a challenging career path. Never stop challenging yourselves, because these challenges will give you opportunities to learn and grow beyond your expectations.

Alinda: If you know your ABCs, understand the number line and have a cup of determination, then that's all you need to know that you have what it takes. Everything else is about building up from the basic foundations, which means that you can learn anything and excel at it. Don't be afraid of failure! You will be surprised how much you learn from it and how much you learn about yourself and grow because of that.



Pictured above: Students of Jangwani Girls' Secondary School, Tanzania working on a STEM activity during a Joule Foundation workshop. (Photo Credit: James Adsoni, @Mr_photo_tz)

OPPORTUNITIES FOR ALUMNAE ENGAGEMENT

There are many ways for you to get involved with WIEP. Listed below are some volunteer opportunities. If you have an interest, please complete this online form. The form will provide us with information for our database.

These opportunities are open to everyone and unlimited in number. Let us know you are interested, and we will get you set up.

- **Access Alum** (*informal chats with current students while on campus visiting, recruiting, etc.*) - Needed: alumni to inform us when they'll be on campus and available for an event.
- **WE Link** (*connecting with high school seniors as they apply and ultimately decide whether Purdue engineering is the place for them*) - Needed: guest bloggers sharing experiences that encourage and inspire. Visit The Engineering Experience Blog.

These programs are looking for recent alumnae (within the last 10 years). If you meet that criteria, let us know you are interested, and we will invite you!

- **Exploring Engineering at Purdue days** (*one day on-campus recruiting programs for high school juniors and seniors*) - Needed: panels of engineering professionals less than 10 years from graduation to talk about what they do in the "real world"

These programs need inspirational and engaging speakers whose talks are interactive with a message aligned to course/program objectives. There are a limited number of openings. If you let us know you are interested, we will be in touch if we find a good fit.

- **Mentors & Mentees (M&M)/Graduate Women in Engineering Network (GWEN)** (*Undergraduate and Graduate student mentoring programs*) - Needed: facilitators of interactive/workshop style topics including but not limited to: life skills, engineering roles, non-traditional paths, life/work balance, finances, Entrepreneurship, global etiquette.
- **ENGR 194** (*Women in Engineering Seminar for first year students*) - Needed: motivational alumnae who share college experiences and relate those to where they are now and what they do in their positions.

If you are interested in doing outreach programming near where you live, let's talk to see if becoming an Engineering Outreach Partner is right for you!

- **Engineering Outreach Partner (EOP) Initiative** (*sharing our outreach model, best practices, training, and other resources nationally*) - Needed: alumnae partners who can help share WIEP's vision and passion for advancing youth education by leading pre-college students in hands-on engineering activities and/or interactive discussions.

VALUED VOLUNTEERS

ALUMNI AND CORPORATE PARTNERS

PROGRAM	NAME	PURDUE DEGREES	COMPANIES
AA; ENGR 194	Sue Abreu	BS IDE	US Nuclear Regulatory Commission
AA	Mope Akande	PhD ECE	The Joule Foundation
AA	Alyssa Arentz		BNSF Railway
SEE PU	Amanda Bade	BS CHE; BS CH	Cargill Dry Corn Ingredients
AA	Alexis Brannan	BS CHE	3M Corporation
SEE PU	Anna Bukur	BS IE	Finish Line
AA	Andrea Chavez	BS AAE	Ball Aerospace & Technologies Corp.
SEE PU	Erin Combs	BS MSE	DePuy Synthes
SEE PU	Kassie Coverdale	BS ABE	Terra Drive Systems
AA; ENGR 194	Stefanie Darlington		GE Aviation
AA; ENGR 194	Julia Derloshon	BS CHE	General Mills
SEE PU	Olivia Fahnestock	BS IE	DaVita Kidney Care
SEE PU	Becca Feick	BS BME	Cook Biotech Inc.
M&M	Katie Fox	BS IE	AbbVie
AA; ENGR 194	Janet Goings	BS EE	General Motors Company
M&M	Himaja Govindaraju	BS BME	Cook Biotech
I2R	Melanie Grande	BS AAE	NASA Langley Research Center
SEE PU	Jackie Grimm	BS ABE	Weston Goods
AA; ENGR 194	Jenny Grove	BS CHE	General Mills
M&M	Jill Hagan	BS IE; MS IE	Eli Lilly & Company
AA; ENGR 194	Cree Harris	BS IE	Clif Bar Baking Company
ENGR 194	Domenica Hartman	BS MSE	Hartman and Hartman, P.C.
AA	Syaqinah Harun	BS CHE	CSL Behring
AA	Kelsey Haury	BS CHE	Eli Lilly & Company
AA; ENGR 194	Sara Hoffman	BS CE	GE Transportation
SEE PU	Jennifer Hyman	BS CE; MS CE	Civiltech Engineering Inc.
AA	Sarah Jaderlund	BS IE	BNSF Railway
SEE PU	Rachael Janney	BS ME	General Motors
AA	Carrie Kendrick	BS ME; MBA	Honeywell Aerospace
AA	Ashley Koeplin	BS CHE	Solvay Composite Materials
AA; ENGR 194	Julie Kramer White	BS AAE	NASA/Johnson Space Center
M&M Pair	Amy Landis		Colorado School of Mines
ENGR 194	Christy Lane	BS IDE	GrowingKids Pediatrics, LLC
AA	Bridette Lauzze	BS ME	3M Corporation
SEE PU	Brittany Leigh	BS ME	Bejin Bieneman PLC
M&M Group	Kathleen Lorenz	BS IE	Leadership Illinois
AA	Susan Lozier	BS CHE	Duke University
AA	Sonia Malo-Alvarez	BS EE	CSL Behring
AA; M&M	Sharon Marchinski	BS ME	Accenture
M&M	Savannah Marstall	BS NE	Enercon

VALUED VOLUNTEERS

ALUMNI AND CORPORATE PARTNERS

PROGRAM

AA
AA; M&M
SEE PU
M&M
M&M
AA
AA; M&M
SEE PU
AA
SEE PU
SEE PU
AA
AA
M&M
M&M
SEE PU
AA
M&M; ENGR 194
M&M
M&M

NAME

Alinda Mashiku
Jordyn McCord
Meghan McKendry
Beverly Mentzer
Cortney Mushrush
Shay Ogebule
Josephine Peterson
Jessica Pilotte
Melissa Plourde
Marissa Rahmann
Monica Rosenberg
Tamaira Ross
Lisa Rueschhoff
Hilary Schmidt
Rebecca Sheehan
Gabriela Sims
Krithika Subramaniam
Krista Toler
Missy Ullmer
Blair Wong

PURDUE DEGREES

PhD AAE
BS ABE; BS PS
BS IE

BS CHE
PhD CHE
BS CHE
BS CE
BS ME
BS ME
BS EEE
BS AAE; MS AAE
PhD MSE

BS IE
BS ME
BS CHE
BS ME; MS BME
BS BME
BS ME

COMPANIES

NASA
Eli Lilly
XPO Logistics

PepsiCo
Intel Corp.
Procter & Gamble
TranSystems
General Mills
Cobham
Walsh Construction
Blue Origin, LLC
AirForce Research Laboratory, Wright-Patterson AFB
Cook Biotech
PepsiCo
Panduit
3M Corporation
Zimmer Biomet
Eli Lilly & Company
Pariveda Solutions



Thank you to all of our valued volunteers. The success of our programming from August - December 2018 wouldn't have been possible without the outstanding support from the listed alumni, faculty, staff, students, and friends who graciously volunteered their assistance to WIEP.

VALUED VOLUNTEERS

PURDUE FACULTY, STAFF AND STUDENTS

PROGRAM	NAME	SCHOOL/DEPARTMENT
GWEN	Valeria Andreoli	School of Mechanical Engineering
GWEN	Hanna Cebull	Weldon School of Biomedical Engineering
ENGR 194	Caitlyn Eng	School of Mechanical Engineering
ENGR 194	Kendra Erk	School of Materials Engineering
M&M	Will Evans	Health & Wellness Program
ENGR 194	Yichen Fan	School of Industrial Engineering
GWEN	Samira Fatemi	School of Agricultural and Biological Engineering
ENGR 194	Emily Fredette	School of Electrical and Computer Engineering
I2R	Carolyn Frueh	School of Aeronautical and Astronautical Engineering
GWEN	Katherine Leyba	Weldon School of Biomedical Engineering
GWEN	Sara Lyons	School of Mechanical Engineering
I2D2	ME Ambassadors	School of Mechanical Engineering
M&M	Ray Mentzer	Davidson School of Chemical Engineering
GWEN	Mina Ostovari	School of Industrial Engineering
GWEN	Hamna Qureshii	Weldon School of Biomedical Engineering
I2R	EPICS Space Day Team	EPICS
GWEN	Michelle Visbal Onufrak	Weldon School of Biomedical Engineering
ENGR 194	Eva Zenk	Davidson School of Chemical Engineering

ABBREVIATIONS & ACRONYMS DICTIONARY

WIEP PROGRAMS

AA- Access Alum
 ENGR 194- Women in Engineering Seminar
 GWEN - Graduate Women in Engineering Network
 I2R- Innovation to Reality
 M&M- Mentors and Mentees
 M&M Group- Mentors & Mentees Group Mentoring Program
 M&M Pair - Mentors & Mentees Pair Mentoring Program
 SEE PU- Seniors Exploring Engineering at Purdue

DEGREE

BS- Bachelor of Science
 MS- Master of Science
 MBA- Master of Business Administration
 PhD- Doctorate

DEGREE PROGRAM

AAE- Aeronautics and Astronautics Engineering
 ABE- Agricultural and Biological Engineering
 BME- Biomedical Engineering
 CE- Civil Engineering
 CH- Chemistry
 CHE- Chemical Engineering
 ECE- Electrical and Computer Engineering
 EE- Electrical Engineering
 EEE- Environmental and Ecological Engineering
 IDE- Interdisciplinary Engineering
 IE- Industrial Engineering
 ME- Mechanical Engineering
 MSE- Materials Science Engineering
 NE- Nuclear Engineering
 PS- Pharmaceutical Science



PURDUE
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Women in Engineering Program

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