One Girl’s Journey in Engineering

PAVE YOUR OWN PATH!

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Tickle College of Engineering
University of Tennessee, Knoxville
One Story...

Story begins many years ago when there were:
- No internet!
- No cell phones!
- No social media, texting, snapchat,...
A typical(?) girl

Loved to:
- play with baby dolls
- play with mom’s makeup
- do ballet
- play hopscotch

Wanted to be a mom when I grew up (like many women in TV shows)

Atypical(?) girl

Loved to:
- solve riddles and puzzles
- wondered how and why
- run fast(er than boys)
- jump high(er than boys)
- write stories

Had male figures in my life who had no gender specific expectations from me
Mentors make a difference

I was shy

I didn’t have confidence

CAN I?? 🙁

I CAN! 😊
Mentors make a difference

I was shy

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I didn’t think I was as smart as it takes

CAN I???

I CAN! 😊
Mentors make a difference

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Unexpected mentors
Mentors who didn’t realize they were
Brief conversations

CAN I?? 🤔

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5th grade (extracurricular activity)

CAN I???

I CAN!
Mentors make a difference

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Unexpected mentors
Mentors who didn’t realize they were
Brief conversations

5th grade (extracurricular activity)
8th grade (literature teacher)
11th grade (HS principal)

CAN I???

I CAN!
My journey (of "I CAN"’s)

Grad school – Electrical Engineer
1st job, 2nd job...

Best job ever

K-12, college
What I do as an engineer

✓ Think
✓ Innovate
✓ Design
✓ Lead
✓ Manage $$$
✓ Educate
✓ Advocate

✓ Write
✓ Test
✓ Measure
✓ Program computers
✓ Work alone / work in a team
✓ Work in a lab / work from home / work on a computer

Engineers can wear many hats, it’s all about where your passion is
What I do as an engineer – University of Tennessee

Keeping up with Kilic

Associate Dean Ozlem Kilic has surely gotten to know UT in her first several months on the job. A full schedule keeps her in motion from her HQ in the TCE Office of Academic and Student Affairs, across campus, and back.

Kilic delivers an overview on climate change to Chancellor’s Honors students at the Howard Baker Center. She shared with them the dangers facing the world, but also more hopeful developments and how we can be a powerful force to impact change.
What I do as an engineer

Kilic helped present awards during the 17th Annual Tennessee Louis Stokes Alliance for Minority Participation (TLSAMP) Research Conference in February 2020. TLSAMP brings together underrepresented students for presentations, discussions, and poster competitions related to engineering, math, science, and agriculture. Kilic serves as a co-PI on this multi-institution program funded by NSF. One of her top priorities is to serve the underserved and underrepresented as she leads TCE’s student and academic affairs. She has been submitting proposals and is eager to collaborate across the campus in seeking grants to address diversity and workforce development.

Kilic catches up with the progress of her research team that’s working on developing detection devices for a variety of applications ranging from vital signature detection, drone based remote sensing systems, large scale electromagnetic modeling on hardware accelerated platforms, and 5G applications of antenna and RF systems.
What I do as an engineer – University

Listen to the EARTH
Three Faculty Members Caring for the Planet

Oslem Kille, associate dean of the School of Engineering and professor of electrical engineering and computer science, is the director of the Engineering Center for Care of Earth (ECCCE). She organized the international climate change workshop held on campus in November 2017, and is now at work planning a second conference, scheduled for April 16-17, 2019. People can register for the conference at on-climate.com/2019-conference/registration.
What I do as an engineer – government and industry jobs

Army Research Labs & Naval Surface Warfare Center

Lockheed Martin
Leadership on Sustainability

Director, Engineering Center for Care of Earth

Vatican visit, Feb. 25, 2019
Pope Francis

Istanbul visit, March 5, 2019
Patriarch Bartholomew

James Baker, former Undersecretary of Commerce

International team of climate experts
Doors engineering opened for me

Teacher
Mentor
Leader
Researcher
Serve military, NASA, industry
Have fun and get paid for it!
Why am I here today

Perhaps I can offer that short, unexpected conversation
Be that unexpected mentor
Whether you are a girl or boy
Whether you want to be an engineer or not

My unexpected mentors and education led me to engineering

Engineering changed my life
- Little shy girl to someone who gives talks across the globe
- Girl in Istanbul to PhD in Washington, DC

You can too – if you want to!
One lesson learned...

Everything changes!

1. “There is nothing permanent except change.” -Heraclitus

2. “To improve is to change; to be perfect is to change often.” -Winston Churchill
Change is good.

Change makes us adapt and thrive
We can’t avoid it
We must embrace it
Change is triggered by someone thinking/acting differently than others
That IS a GOOD thing!
DON’T BE AFRAID TO BE DIFFERENT
PAVE YOUR OWN PATH!
Some examples of great changes

Magic! No wires!

This is the “magic” of electrical engineers and computer scientists
Magnetic ladle to satellite-based GPS

Model of a Han Dynasty (206 BC–220 AD) south-indicating ladle

Earth observing satellite
Magnetic ladle to satellite based GPS

Model of a Han Dynasty (206 BC-220 AD) south-indicating ladle
Magnetic ladle to satellite based GPS

Model of a Han Dynasty (206 BC–220 AD) south-indicating ladle

This is the collective magic of electrical, mechanical, aerospace engineers, rocket scientists, computer scientists
Our earliest greatest invention.. Fire

Energy
Light and visibility
Weapon
Food

We didn’t start the fire...

but we kept it going:
◦ where we wanted,
◦ when we wanted, and
◦ how we wanted
Candlelight to light bulbs
Candlelight to light bulbs

This is the “magic” of electrical engineers
Our \textit{(one of the)} most important invention...

Ingenious wheel-and-axle concept

Required excellent carpentry

Invented in far east (3500 BC), spread like wildfire to Eurasia
Evolution of wheel
From carriage to luxury electric vehicles

This is the “magic” of physicists, mechanical engineers, electrical engineers,
Counting to computing

Tally sticks

1, 2, ...

Abacus (invented in Babylon, 2400 BC)

5, 10, 15, ...
Computing is inherent to humans

We are naturals when it comes to math

Math is the universal language

Counting, more vs. less, tall vs short,…

We were always obsessed with computing

Fascination never stopped doing math faster, better…

This is the “magic” of mathematicians
Computing is natural to girls!

First computer programmer:

Augusta Ada Byron

Suggested to Babbage to use the binary system (numerical system that only uses 0 and 1)

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Then and now in computing

This is the “magic” of mathematicians, mechanical and electrical engineers, and computer scientist.
It was engineers who...

- created the world’s tallest, fastest roller coaster
- designed the airplane or the car that takes you and your family to the theme park
- came up with text messaging
- invented the smart phones or solar plants
- were the minds behind almost all of today’s technologies
Engineers find ways to turn dreams into reality.

They also find ways to turn challenges into opportunities.
Many flavors to choose from:

- Electrical
- Mechanical
- Civil
- Aerospace
- Biomedical
- Material
- Chemical
- Computer
- Environmental

https://tickle.utk.edu/departments/
https://tickle.utk.edu/engineering/

Engineer’s Day
Thursday, October 29, 2020
Join us!
Question is....

Do you want to lead the change
Or
Watch it happen
I CAN! 😊

Can you?!