



Re-Envisioning Robotics in Precollege Engineering Education: A Collective Partnership between e4usa & FIRST

December 12, 2023

2:00 PM – 3:00 PM, ET

This webinar is part of a larger series on building community and reflecting to re-envision in engineering education.



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learning.asee.org



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COURSE CATALOG

The ASEE Course Catalog features a variety of education and career development resources to help promote the continued learning and career success of engineering educators and professionals. Search by topic, type, delivery method, skill level, and more. Embark on your learning journey today!

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Topic

- ☐ Career Development
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- ☐ Research
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Type

- ☐ Distance Learning

Displaying 20 results of 70



1

2



Stigma of Mental Health Conditions as a Barrier to Addressing the Mental Health Crisis in Engineering

Through this webinar, I learn more about

Reflecting on Positionality to Re-envision Our Impact in Equity Research and Practice

Through this webinar, explore the

Culturally Responsive Energy Engineering Education in Rural/Reservation Elementary Schools

Through this webinar, learn about a

Before We Begin



Interact with us
and each other...



Complete our survey and
access webinar materials.

Questions?



Use Q&A pod at
any time or...



Wait for the Q&A at the
end of the webinar.

Today's Speakers



Adam Carberry

Professor and Chair, Engineering
Education

The Ohio State University



David Rogers

Chief Development Officer

DEKA Research



RE-ENVISIONING ROBOTICS IN
ENGINEERING EDUCATION:
A PARTNERSHIP BETWEEN E4USA & FIRST

ASEE WEBINAR
TUESDAY, DECEMBER 12



FIRST®



TODAY'S AGENDA

1. Quick Introduction
2. e4usa+FIRST
3. eXperiential Robotics
Platform (XRP)
4. Practicing Teacher
Reflections
5. Q&A / Discussion

E4USA+ FIRST TEAM



Adam Carberry

Principal Investigator and Co-Principal Investigator for e4usa



David Rogers

Project Consultant



Medha Dalal

Co-Principal Investigator



Brad Miller

Project Consultant



Steve Efe

Principal Investigator



Petronella James-Okeke

Co-Principal Investigator



Assad Iqbal

Visiting Research Scholar

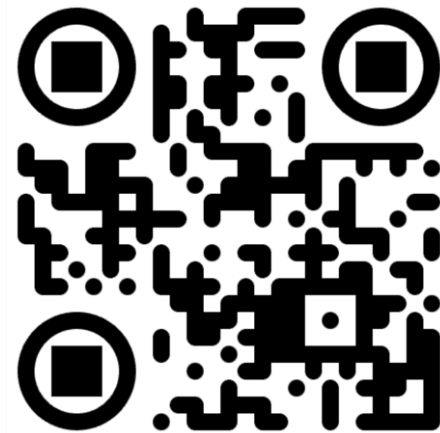
ACKNOWLEDGEMENT



Collaborative Research:
Leveraging the Collective
Strengths of e4usa and FIRST for
Greater Impact on the Future
Engineering Workforce, EEC-
2113312 & EEC-2113402



engineering
4 us all



<https://e4usa.org/>

E4USA CURRICULUM OVERVIEW

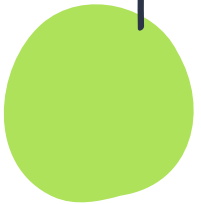
Established 2018; 30-week, high school level course consisting of 4 threads.

Discover
Engineering

Engineering
Professional
Skills

Engineering in
Society

Engineering
Design



E4USA CURRICULUM UNITS

Introducing Engineering

Unit 1 - Engineering is Everywhere

Unit 2 - Engineering is Creative

Applying Engineering:

Generating a solution to a local problem

Unit 3 - Engineering is Human-Centered

Unit 4 - Engineering is Responsive

Applying Engineering:

Generating a solution to a global issue

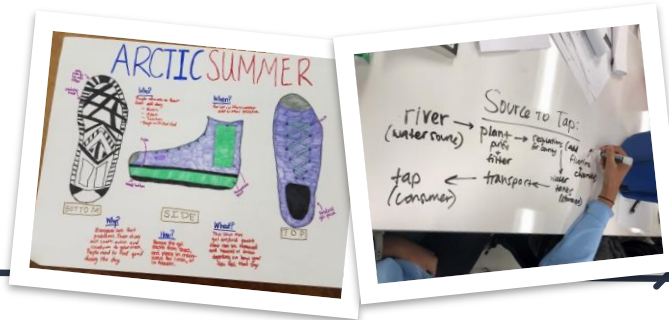
Unit 5 - Engineering is Intentional

Unit 6 - Engineering is Iterative

Generating an engineering solution
to a problem relevant to you

Unit 7 - Engineering is Personal

Unit 8 - Engineering is Reflective



E4USA COMMUNITY OF PRACTICE

e4usa
university/industry
liaison



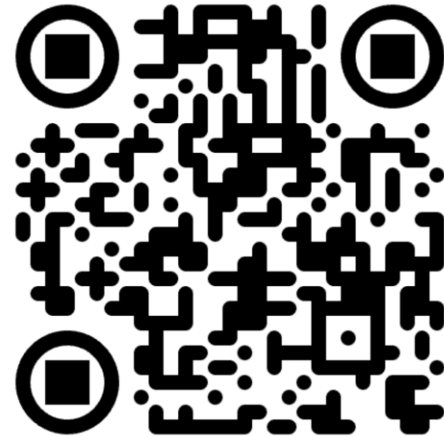
e4usa
engineering
educator



e4usa
coach



community
partners



<https://www.firstinspires.org>

FIRST

Established (1989) robotics community preparing young people for the future. Offers multiple team-based robotics programs (PreK-12) facilitated in school or afterschool. FIRST philosophies of *gracious professionalism* and *coopertition* are expressed through 6 core values.

Discovery

Impact

Teamwork

Innovation

Inclusion

Fun

FIRST TECH CHALLENGE OVERVIEW



“Way more than building robots.”

- X teams of up to 15 members
- X grades 7-12
- X head-to-head competition
- X guided by adult coaches and mentors
- X reusable robot kit



**ENGINEERING
FOR US ALL**

+



FIRST®

Creating and Leveraging Synergies

OVERARCHING GOAL

Provide engineering education experiences to underserved populations

- X Create blended e4usa and FIRST models
- X Offer e4usa+FIRST teacher professional learning
- X Link teachers to mentors, universities, and industry
- X Establish program scalability and sustainability

Implementing a Diverse, Equitable, and Inclusive Culture

WHAT IS MEANT
BY BLENDING?





Blending content in
a single classroom



Blending between
multiple teachers &
multiple offerings



Blending classroom
& extracurricular

Maybe something we haven't
thought of...yet.

e4usa+FIRST Models

FIRST = FIRST Tech Challenge (FTC)



e4usa Curricular
+ FIRST
Extracurricular

e4usa + FIRST
Co-curricular
and
Extracurricular

e4usa + FIRST
Concurrent
Curricular

e4usa + FIRST
Sequential
Curricular

OVERVIEW OF MODELS



e4usa Curricular + FIRST Extracurricular

- e4usa is a stand-alone course
- FIRST is an extracurricular activity (FTC)
- both programs open to all students

e4usa + FIRST Co-curricular and Extracurricular

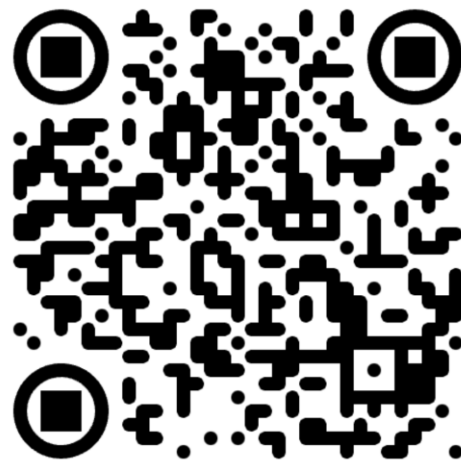
- e4usa and FIRST taught together in a single course
- FIRST is also an extracurricular activity (FTC)
- both programs open to all students

e4usa + FIRST Concurrent Curricular

- e4usa and FIRST taught together in a single course
- content separated within the course
- course open to all students

e4usa + FIRST Sequential Curricular

- e4usa and FIRST taught as separate, sequential courses
- e4usa course is a prerequisite for FIRST course



<https://experientialrobotics.org>

EXPERIENTIAL ROBOTICS: ASSEMBLY



EXPERIENTIAL ROBOTICS: MOVEMENT GUIDE



EXPERIENTIAL ROBOTICS: DELIVERY CHALLENGE



HEAR FROM E4USA + FIRST TEACHERS

Amanda Jones - Riverdale High School (TN)

Arren Buck - Sandia Preparatory School (NM)

Scott Dooley - Christel House Academy South (IN)

Karolyn Thacker - White Plains Academy (TN)

CONTACT INFORMATION

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The background consists of several overlapping triangles in various shades of blue and teal. The colors range from a deep navy blue to a lighter, almost white teal. The triangles are arranged in a way that creates a sense of depth and movement, with some pointing towards the center and others pointing towards the edges.

Questions?

Next Steps



Share your feedback...



Access webinar materials.

The background consists of several overlapping triangles in various shades of blue and teal. The colors range from a deep navy blue to a bright, vibrant teal. The triangles are arranged in a way that creates a sense of depth and movement, with some triangles appearing to be in front of others.

Thank you!