COST & COMPENSATION
How much will it cost for my school to implement E4USA? What resources will be provided to E4USA schools?
There is no charge for the E4USA curriculum. The curriculum is designed to be comparatively low cost to implement. Schools that are accepted to E4USA will receive financial support up to $2,500 to cover the costs of materials and supplies, as well as any other resources required to implement E4USA.

Will teachers be compensated for participating in E4USA?
Each selected E4USA instructor will receive a stipend in the amount of $5,000 to compensate them for their time and efforts implementing the E4USA program at their school. Stipends will be issued in installments throughout the academic year.

Will any credit be offered to teachers who participate in professional development (PD) through E4USA?
Acknowledging that credit-bearing PD is oftentimes state-specific, and possibly district or county-specific, credit is not currently being granted at this time. However, the team does hope to pursue this effort in the near future as we scale up.

For schools that are not located in the key geographic areas (MD, VA, AZ) what financial support will be offered to support the implementation of the curriculum?
High schools in other areas will need to have a college/university partner that has agreed to support that specific geographic territory. E4USA leadership has reached out to colleges and universities throughout the country in an effort to generate more interest in the program. College/university partners will be asked to support each high school in their state or region in a variety of ways that include $5,000 for teacher stipends, and $2,500 for materials and supplies. To determine if a college/university partner has been identified for your geographic region, please email e4usa@umd.edu.

COLLEGE CREDIT
How will college course credits be earned for this course? Will it be CLEP or credit by exam?
The course credits will be earned via credit by exam, which is generally designed as an exam for registered/enrolled students at a particular college or university. Assuming students pass this exam, they are granted credit for the course at that specific institution. Please note that this is different from the Advanced Placement exam model, in which students typically take exams at the conclusion of the respective course in high school and learn their score shortly afterwards.

Is credit by exam institution specific? If I take the credit by exam course for one institution, will it be accepted by another institution?
Credit by exam is indeed specific to an institution, but the goal of E4USA is for all college/university partners to be accept the course. At this point, those details are not confirmed or guaranteed for all colleges and universities involved, but we hope that this will be one outcome of this project.

Which institutions will offer college credit for E4USA?
A substantial number of engineering deans throughout the country have indicated their support of E4USA. At this time, we have not yet identified the complete list of colleges and universities that will accept this course for
college credit, nor do we know what specific course this would potentially replace (e.g., an introductory engineering course, a general education requirement). To determine whether a specific college or university will accept this course for credit, please contact that respective institution.

CURRICULUM
What is the framework of the course?
The curriculum is to be designed as a thirty week course focused on four “big ideas.” Unlike other Engineering offerings, this course is a design focus, not a technology focus or survey course.

- Discovering Engineering
- Engineering in Society
- Engineering Professional Skills
- Engineering Design

What special software / hardware / equipment is required?
The course is more process and design oriented as opposed to covering any specific software or hardware. While material requirements will vary somewhat according to student designs, the curriculum is designed to be lower in cost and not require any specific hardware or software.

Is the E4USA curriculum aligned to a set of national or state standards?
We expect to have guidelines for alignment to standards toward the end of our pilot year.

What age students is this curriculum designed for? Is any particular background required of the students?
The curriculum is designed at a high school level, most likely junior / senior level. The unique focus of “For Us All” means this course can be offered with no prerequisites.

What ongoing supports are offered to teachers who are implementing the E4USA curriculum in their classrooms?
The team of teachers and team members are forming a community of practice. Support is available through our learning management system; additional support structure (webinars, online discussions, periodic professional development opportunities) are also under development.

What are the must-have skills or background knowledge for teachers? For students?
The E4USA requires no advanced background skills other than the student’s ability to effectively write and communicate. The E4USA curriculum is tailored to build knowledge and skills in engineering, and also empower students to develop essential skills such as problem solving, critical and creative thinking, communication, collaboration, and perseverance.

In the E4USA curriculum, are there formative assessment such as homework requiring accessibility to internet at home?
In some units, there is homework which requires the use of the internet. In case you do not have internet services, use your time effectively and efficiently in class. There are public libraries and college libraries which are accessible to students who are enrolled in the E4USA course.

Is the curriculum designed to be rigidly followed or flexible?
The curriculum is designed to be flexible and adaptable. Units and lessons have been designed with input from K-12 teachers, university faculty, and researchers. All components are viewed as important, but can be delivered to students as individual teachers see fit.

In what timespan is the E4USA curriculum meant to be delivered?
The E4USA curriculum was designed to be a full year course; however, teachers during the pilot year are implementing the curriculum in a variety of ways including within a single semester.
**How is E4USA different from Project Lead the Way (PLTW)?**
This course is different from PLTW in that it encourages participants to explore their individual, local, regional, global contexts. It explores ways in which engineering can immediately impact participants' environments. Whereas PLTW is largely focused on developing engineers, this course emphasizes the idea of thinking like an empathetic engineer without necessarily becoming an engineer. Therefore, for this program, “success” will be defined not only by the number of students who move into traditional engineering disciplines, but also by the ways in which students can apply complex thinking gained from this course in potential future careers. Finally, this course will offer college credit that will be accepted at select engineering schools throughout the country. For educators, this course is unique in that it engages students in active learning rather than more prescriptive or passive learning paradigms. Instructors will motivate participants to be able to apply their skills and adapt to different environments, rather than memorize specific points to demonstrate content knowledge.

**How difficult is it to adapt the E4USA curriculum to my existing curriculum?**
While this would certainly depend on your existing curriculum, the E4USA curriculum is meant as a complete, stand-alone curriculum rather than a supplement or addendum to other curricula.

**Who can I contact if I have questions about specific curricular materials?**
Ken Reid (kenreid@vt.edu) from Virginia Tech is lead on the Curriculum Committee.

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**PROFESSIONAL DEVELOPMENT**

**Do I have to have an engineering background to become an E4USA teacher?**
High school teachers in all content areas are eligible to partner with us! No prior engineering teaching experience is required. The E4USA curriculum is intentionally designed to increase access to engineering by providing a curriculum that can be taught by any high school teacher to any high school student.

**What are the E4USA professional development opportunities for engineering educators?**
In 2019, the pilot year of E4USA, engineering educators participated in three Spring Virtual Professional Developments in mid-April. A week-long Summer Development Workshop occurred in late-June and again in late-July. Another workshop will occur in December to gather all of the engineering educators and E4USA team. Throughout the academic year, the engineering educators will have opportunities to engage in and build a Community of Practice.

**Are the professional development opportunities optional for participating engineering educators?**
Recognizing the importance of professional development opportunities in helping educators prepare for the academic year and provide sustained support, the professional development opportunities are required for participating educators.

**Once the academic year begins, how do educators remain connected to one another or with the E4USA team?**
An E4USA Professional Development Canvas course serves as the platform to engage educators in the Community of Practice throughout the school year. Educators are provided and must complete reflective prompts and activities each week, which are posted on Canvas. Educators are also encouraged to use the platform to share created resources with one another and to ask questions of their fellow educators and the E4USA team. The E4USA team will also visit the educators in their classrooms, and both the team and educators will reunite for an in-person December Workshop.

**Will any credit be offered by participating in professional development through E4USA?**
Acknowledging that credit-bearing PD is oftentimes state-specific, and possibly district or county-specific, credit is not currently being granted at this time. The team does hope to pursue this effort in the near future as we scale up. A certificate of participation can be provided to educators upon request.
With regards to scaling up and sustaining, how does E4USA plan to expand the Professional Development and Community of Practice to ensure meaningful engagement?
Scaling and sustaining the Professional Development and Community of Practice are essential in broadening the impact of E4USA. The E4USA team continues to explore innovative, technology-based ideas and partnerships with institutions of higher education and organizations such as TeachEngineering. Overall, the aim is to intentionally scale up to ensure that the E4USA Professional Development remains responsive to educators and students, as well as continue to develop a cohesive Community of Practice that provides sustained support.

Who can participate in the E4USA professional development opportunities?
The E4USA Professional Development and Community of Practice are specifically intended for high school engineering educators who are committed to piloting the E4USA Curriculum. However, interested engineering educators and school administrators may request to observe and participate in the Professional Development, Canvas, and Community of Practice.

RESEARCH & DATA
What are the expectations for principals, teachers and students as it relates to the collection of student or school-level data?
We encourage participating high schools to complete surveys requesting data at the school, teacher, and student level. Student performance in the course will be aggregated, and the identities of interview and focus group participants will be protected using pseudonyms. Although participating in this process is highly encouraged, it is not required.

What type of information and data is collected?
E4USA requests (but does not require) that participating teachers and students complete surveys and participate in interviews and/or focus groups throughout the academic year. Teachers are also asked to participate in research activities during the summer professional development. Participating teachers, parents and students are asked to sign consent/assent forms prior to their participation.

What steps are you taking to protect your data and participant confidentiality?
All data and records will be kept in a secure online location and/or in a secure storage location at the E4USA’s home institution, University of Maryland. The E4USA research team will assign each student a unique ID which will be used in all research and analysis to protect the students’ identities. All data will be reported at the aggregate level (by classroom, school, etc.); no individual level analysis that could compromise a student’s anonymity will be reported.

OTHER
Can a school have multiple participating teachers?
A school can have more than one participating teacher; however, E4USA provides funding for only one teacher stipend at each high school. Therefore, if two or more teachers wish to participate, the stipend will need to be distributed amongst these teachers.

Is there a limit on the number of students who can participate?
While no limit has been established as of this date, an ideal number of students for each class is between 20 and 30.

If this course is not approved in my school district, can I still apply?
E4USA staff are willing to work with partner high schools and districts to obtain district approval for the course.
FOR COLLEGES/UNIVERSITIES

GENERAL

What is expected of participating colleges and universities?

E4USA asks that participating colleges and universities:

• Consider accepting this course for college credit on their campus
• Offer their campus as a site for professional development (*note: this does not obligate a college/university to actually facilitate the professional development, but only to offer it as a host site*)
• Become a member of the community of practice
• Provide $7,500 in funding for each high school they support ($5,000 for a teacher stipend, and up to $2,500 for materials and supplies)
• Serve as a resource to provide technical, logistical and other curricular support to teachers

What are the benefits of becoming an E4USA partner?

Our university partners have the opportunity to:

• Directly impact the training and preparation of teachers within their geographic area.
• Inspire students to understand how engineering is used in everyday life, and to encourage them to consider applying to their college or university for their postsecondary studies.
• Potentially recruit from a diverse population of high school students, and encourage students to explore one of the engineering majors within their college or university.

We already have an existing introductory engineering course on our campus. What are the implications for adding this course?

This course is designed to be a general education-level course, as its content is very different in scope than what a first-year engineering student might encounter. As such, E4USA hopes that this course might satisfy some type of general education-level course requirement at each participating institution.

COST

What are the financial obligations of university partners?

The total cost for supporting an E4USA high school site is $7,500 per classroom per year. Each E4USA college/university must provide financial support in the form of $5,000/year as a stipend per teacher at each high school. Institutions must also be able to provide $2,500 in funding for classroom materials and supplies. Stipends will be an annual cost, while materials and supplies generally should not be as cost-intensive in subsequent academic years.

COLLEGE CREDIT

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If I become a partner college/university, will I be required to accept the E4USA course for credit at my institution?
We ask that partner institutions consider offering college credit for the E4USA course. Although it is encouraged, partner institutions are not required to offer credit for the course. Those who do accept E4USA for credit may offer credit fulfilling various requirements (i.e. general education/core requirement, engineering requirement, free elective, etc.).

CURRICULUM

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Who can I contact if I have questions about specific curricular materials?
Ken Reid (kenreid@vt.edu) from Virginia Tech is lead on the Curriculum Committee.
Can my college/university conduct research on outcomes associated with E4USA without agreeing to support a local high school?

Not at this time. E4USA is primarily focused on ensuring that partners are committed to the goal of supporting high schools with curricular, logistical, and other forms of support.

What are the expectations for my institution if we are supporting a local high school?

Partner institutions will be asked to assist in completion of their institutional IRB process as well as any IRB processes required by their high school district. Partner institutions may also be asked to assist in the collection of data from their partner high school.

What type of information and data is collected?

E4USA requests (but does not require) that participating teachers and students complete surveys and participate in interviews and/or focus groups throughout the academic year. Teachers are also asked to participate in research activities during the summer professional development. Participating teachers, parents and students are asked to sign consent/assent forms prior to their participation.

What steps are you taking to protect your data and participant confidentiality?

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