2021-2022

e4usa Credit and Placement Prospectus

Learn about college course credit and placement opportunities you can receive with Engineering for US All!
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About e4usa

Engineering for US All (e4usa) is an NSF-funded high school engineering program that opens engineering to a new generation of students and educators. Core to the e4usa mission is the nationwide expansion of student and teacher access to engineering, with intentional efforts to reach populations traditionally underrepresented in the field.

To date, e4usa involves 47 participating high schools with approximately 3,500 students.

e4usa students explore engineering in society, develop professional skills, and engage in community-focused engineering design experiences, all aimed at helping them see themselves as engineers.

e4usa provides a standardized educational curriculum for pre-college students to learn and demonstrate engineering principles, skills, and practices. The curriculum incorporates an authentic, design-based experience and affords students the opportunity to earn college credit at participating colleges and universities.
e4usa Curriculum

Engineering is all around us! e4usa empowers, engages, and excites students to use what they know and find what they are passionate about to take control and boldly influence the world.

The e4usa curriculum consists of 8 units. Each unit covers our four signature course threads to help students achieve the following course learning outcomes:

### Discover Engineering

| E.A | Iterate and evolve the definition of what it means to engineer and be an engineer. |
| E.B | Awareness of changing perspectives on one's current identities with respect to engineering through regular reflection. |
| E.C | Recognize the value of engineering for all regardless of one's potential career. |
| E.D | Explain and apply ethical considerations when exploring an engineering problem. |

### Engineering in Society

| S.A | Explore the impacts of past engineering successes and failures on society as a whole. |
| S.B | Use systems thinking to propose and analyze the relationship between inputs, intention, and impacts of technology in society. |
| S.C | Recognize and investigate the world's greatest challenges and the role that engineering plays in solving these challenges (e.g., Engineering Grand Challenges, UN sustainability goals, etc.). |
| S.D | Integrate diverse disciplinary thinking and expertise to inform design solutions that add value to society. |
| S.E | Identify and analyze issues when bringing a solution to scale. |
### Engineering Professional Skills

<table>
<thead>
<tr>
<th>P.A</th>
<th>Apply strategies to collaborate effectively as a team.</th>
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<tr>
<td>P.B</td>
<td>Use various forms of communication (oral, written, visual).</td>
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<tr>
<td>P.C</td>
<td>Recognize when to use various communication tools based on audience.</td>
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<tr>
<td>P.D</td>
<td>Develop, implement, and adapt a project management plan.</td>
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<tr>
<td>P.E</td>
<td>Contribute individually to overall team efforts.</td>
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### Engineering Design

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<tr>
<th>D.A</th>
<th>Uncover a problem that can be solved with a potentially new product or process.</th>
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<tr>
<td>D.B</td>
<td>Identify appropriate stakeholders and evaluate stakeholder input.</td>
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<tr>
<td>D.C</td>
<td>Plan and conduct research by gathering relevant and credible data, facts, and information.</td>
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<tr>
<td>D.D</td>
<td>Model physical situations using mathematical equations.</td>
</tr>
<tr>
<td>D.E</td>
<td>Evaluate solution alternatives and select a final design by considering assumptions, tradeoffs, criteria, and constraints.</td>
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<tr>
<td>D.F</td>
<td>Use and recognize when to use computational tools.</td>
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<tr>
<td>D.G</td>
<td>Create a prototype.</td>
</tr>
<tr>
<td>D.H</td>
<td>Create and implement a testing plan to evaluate the performance of design solutions.</td>
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<tr>
<td>D.I</td>
<td>Apply iteration to improve engineering designs.</td>
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Institutions Awarding Credit

At the start of the 2021-22 academic year, seven institutions in six states have created pathways for students to receive college credit and placement for successfully completing the e4usa high school course.

Additional institutions are exploring ways to offer students credit and placement and we are excited to watch the list of states and institutions awarding credit grow in the near future.
Arizona State University

About Arizona State University

Arizona State University (ASU) is a top ranked research university in the greater Phoenix metropolitan area. The university is a model for the New American University, committed to excellence, access, and impact.

The Ira A. Fulton Schools of Engineering (FSE) is one of the largest and most comprehensive engineering programs in the U.S. FSE offers 25 undergraduate programs and 47 graduate programs housed within 7 schools:

- School of Biological and Health Systems Engineering
- School of Computing and Augmented Intelligence
- School of Electrical, Computer and Energy Engineering
- School for Engineering of Matter, Transport and Energy
- School of Manufacturing Systems and Networks
- School of Sustainable Engineering and the Built Environment
- The Polytechnic School

Fast Facts

**Course:** ASU 194 - Engineering for us all  
**Credits:** 3 in University General Studies  
**Credit pathway:** Concurrent Enrollment  
  
  **Details:** Students interested in earning credit for the course taught at their high school must complete an interest survey. Those completing the survey and submitting payment are enrolled in ASU 194. High school instructors submit a grade for the student at the end of the semester to a point of contact.  
  
  **Point of Contact:** Adam Carberry (adam.carberry@asu.edu) or Medha Dalal (medha.dalal@asu.edu)  
**Cost:** $500  
**Other:** The course has been approved under the general studies designation: Humanities, Arts and Design (HU) and is offered through the College of Integrative Sciences and Arts in collaboration with ASU Prep Digital. Students do not need to matriculate at ASU to earn credits.
Morgan State University

**Fast Facts**

**Course:** ENGR 110: Engineering For US All  
**Credits:** 3 in the General Education Program  
**Credit pathway:** Concurrent Enrollment  
  **Details:** Evaluation consists of 1) e4usa high school engineering design portfolio review and 2) 980 SAT score (Critical Reading and Mathematics) or 19 ACT composite  
**Point of Contact:** Carl White  
  (carl.white@morgan.edu)  
**Cost:** Standard tuition and fee rates offset by state/school district support.  
**Other:** For instructions on how to initiate the process visit: https://www.morgan.edu/office-of-undergraduate-admission-and-recruitment/how-to-apply/dual-enrollment

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**About Morgan State University**

Morgan State University, founded in 1867, is a Carnegie-classified, doctoral, high-research institution providing instruction to a multiethnic, multiracial, multinational student body and offering more than 125 academic programs.

As Maryland’s Preeminent Public Urban Research University, Morgan fulfills its mission to address the needs and challenges of the modern urban environment. Located in a charming residential area of northeast Baltimore, Morgan’s impressive, 152-acre campus features state-of-the-art facilities geared toward innovative teaching and learning in the 21st century. Designated as a National Treasure by the National Trust for Historic Preservation, this National Treasure offers a safe and inviting learning environment with easy access to the best the city has to offer.

The Clarence M. Mitchell Jr. School of Engineering has four accredited undergraduate engineering programs in the areas of Civil Engineering, Electrical and Computer Engineering, Industrial and Systems Engineering, and Transportation Systems Engineering.
Tennessee State University

Fast Facts

**Course:** e4usa students receive credit for ENGR 1020 Freshmen Engineering Seminar with a successful completion of the course. Students may also submit a portfolio of their CAD work for consideration of credit for ENGR 1151 Computer Engineering Graphics and Analysis

**Credits:** ENGR 1020: 1 hr. and ENGR 1151: 1 hr.

**Credit pathway:** dual credit

**Details:** Evaluation consists of 1) e4usa high school engineering design portfolio review and 2) 900 SAT (Verbal and Math Scores Only) and 19 ACT

**Point of Contact:** Dr. Catherine Armwood-Gordon (carmwood@Tnstate.edu)

**Cost:** $0

**Other:** Other students may be reviewed/considered by our Continuing & Distance Education Office for possible credit.

About Tennessee State University

Tennessee State University is a world-class university known for academic excellence, incredible students, inspiring faculty, exceptional value and an amazing campus and community. For more than half a century, the College of Engineering at Tennessee State University has provided a quality education in engineering, technology, and computer science with a mission to increase the diversity of tomorrow's technical workforce.

The College of Engineering offers full-time undergraduate programs leading to the Bachelor of Science degree in the fields of:

- Applied & Industrial Technologies
- Architectural Engineering
- Civil Engineering
- Computer Science
- Electrical Engineering
- Mechanical Engineering

Learn more by visiting: [https://www.tnstate.edu/engineering/index.aspx](https://www.tnstate.edu/engineering/index.aspx)
The University of Indianapolis

About The University of Indianapolis

We believe the R. B. Annis School of Engineering at UIndy is one of the most innovative engineering programs nationwide. Our faculty members embody an attitude of service to our students and partners. We work with our students in our DesignSpine program to ensure that our students are involved in authentic, industry-driven engineering projects from the beginning of their program.

- Computer Engineering
- Electrical Engineering
- Industrial and Systems Engineering
- Mechanical Engineering
- Software Engineering
- Computer Science
- General Engineering

Learn more at: https://www.uindy.edu/cas/engineering/

Fast Facts

Course: ENGR 199 - Pre Engineering Experience
Credits: 1 for e4usa, up to 4 if students have other experience
Credit pathway: Credit granted for participation in e4usa upon admission
  Details: Credit granted for participation in e4usa for students with a grade of B or better, taking the course in 10th grade or later.
  Point of Contact: Dr. Kenneth Reid, Associate Dean of Engineering (reidk@uindy.edu)
Cost: No additional cost for credit in ENGR 199
Other: Scholarships available for e4usa participants: see Engineering for US All - University of Indianapolis (uindy.edu) for details
University of Maryland

About University of Maryland

Located nine miles from the Nation’s Capital, The University of Maryland is the Flagship Institution of the State of Maryland.

The A. James Clark School of Engineering offers full-time undergraduate programs leading to the Bachelor of Science degree in the fields of:

- Aerospace Engineering
- Biocomputational Engineering
- Bioengineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Fire Protection Engineering
- Materials Science and Engineering
- Mechanical Engineering

Learn more by visiting https://eng.umd.edu/prospective-students

Fast Facts

**Course:** ENES 192: Engineering For US All  
**Credits:** 3 in General Education Scholarship in Practice (DSSP)  
**Credit pathway:** Departmental Proficiency Exam  
  **Details:** Proficiency Exam consists of 1) e4usa high school engineering design portfolio review and 2) a 30-minute written examination.  
  **Point of Contact:** Kevin Calabro (kcalabro@umd.edu) or Jackelyn Lopez Roshwalb (roshwalb@umd.edu)  
**Cost:** $30  
**Other:** Students must matriculate at University of Maryland to earn credits. To initiate the process visit: https://ltsc.umd.edu/documents/CBE-Instructions.pdf
University of New Mexico School of Engineering

About Engineering at UNM

Enrollment: 2000 undergraduate, 700 graduate students

One of only 74 engineering programs in the US to receive the ASEE Bronze Award for Diversity

An R1 (high research activity) university and an Hispanic-Serving Institution

Many opportunities for undergraduate research experiences

Over $36 M in annual research expenditures

Centers of Excellence include:
- Center for Biomedical Engineering
- Center for Water and the Environment
- Center for Engineered Resilience and Ecological Sustainability
- Center for Advanced Research Computing
- Center for Micro-engineered Materials

Fast Facts

**Course:** ENGR 195

**Credits:** 3 semester credit hours of general university credit

**Credit pathway:** Dual enrollment credit

  **Details:** Enrollment in an e4usa-affiliated high school course

  **Point of Contact:** Charles Fleddermann, cbf@unm.edu

**Cost:** Free to New Mexico students
Virginia Tech

About Virginia Tech

Located in Blacksburg, VA, next to the Jefferson National Forest, Virginia Tech (VT) has been providing degrees in engineering since 1872. VT is one of largest producers of engineering graduates in the nation and has consistently ranks in the top 20 of engineering schools by US News & World Report.

VT students can earn BS degrees in 14 areas of engineering and computer science including: Aerospace Engineering, Biological Systems Engineering, Biomedical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Computer Science, Construction Engineering Management, Electrical Engineering, Industrial & Systems Engineering, Materials Science & Engineering, Mechanical Engineering, Mining & Minerals Engineering, and Ocean Engineering.

For more information visit: [https://eng.vt.edu/](https://eng.vt.edu/)

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Fast Facts

**Course:** ENGR 2464: Engineering Fundamentals for Scientists  
**Credits:** 2 in Interdisciplinary Engineering and Science (IES) Minor for Life Science majors  
**Credit pathway:** Credit by Examination  
  
  **Details:** Evaluation consists of 1) a review of e4usa portfolio materials and 2) a 1-hour examination (primarily multiple choice with a few short answer questions)  
  
  **Point of Contact:** College of Engineering Academic Affairs ([coeacademicdean@vt.edu](mailto:coeacademicdean@vt.edu))  
**Cost:** Free  
**Other:** Students must be admitted to Virginia Tech to earn credits. To apply for admission to Virginia Tech, visit [https://vt.edu/admissions/undergraduate/apply.html](https://vt.edu/admissions/undergraduate/apply.html).
Stay Connected

There are many ways to stay connected with e4usa! Visit the links below to follow e4usa:

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<th>e4usa Twitter</th>
<th>e4usa YouTube</th>
<th>e4usa Newsletter</th>
<th>e4usa Credit and Placement Team</th>
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<td>Follow us on Twitter for e4usa highlights and opportunities!</td>
<td>Visit our YouTube page to learn more about the e4usa program.</td>
<td>Read a summary of our latest news from e4usa.</td>
<td>Email us with questions related to college credit.</td>
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Acknowledgments

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