

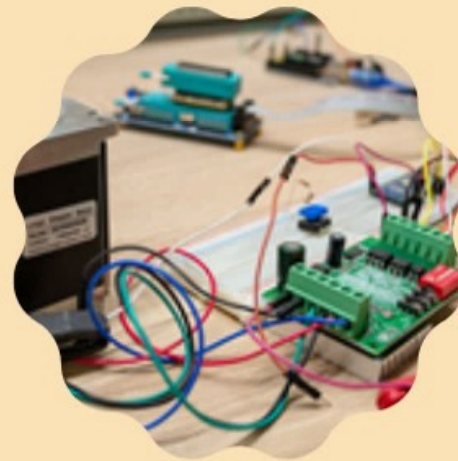
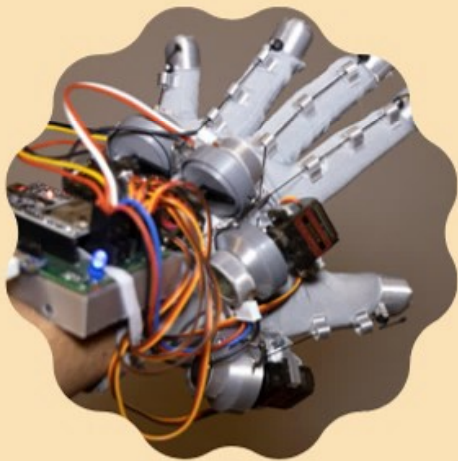
# Engineering Immersion Program (EIP)

Program Snapshot of Curriculum Structure

Location: Zoom Virtual Classroom

9 Saturday Afternoons - June 8th to August 3rd

Session A: 1 pm - 4pm PST // Session B: 4pm - 7pm PST





# Engineering Immersion Program EIP

The roaring of a car engine before a Formula 1 race competition, Paralympic athletes preparing for their basketball tournament using customized wheelchairs, sound systems in a packed filled Opera house, or the ability to turn on your faucet and consume clean water. These are illustrations of all the work that engineers do!

Utilizing a wide array of subjects & tools, Engineers have built a diverse array of products, systems and structures that have changed every sector of our society. Over the course of **9 Saturday afternoons**, high school students will learn about various engineering disciplines and future opportunities throughout the Engineering field as it relates to an education and career paths. EIP students will explore how different STEM academic subjects such as mathematics, physics, chemistry, & computer science converge in the engineering field to solve problems.

## Engineer Professional Speaker Talks & Discussion

We will hear from working professionals in various engineering disciplines. We will hear about subjects related to their work, their professional careers as well as their personal journey into the world of engineering.

## College & Career Pathways

As students learn more about their interests & personal strengths throughout EIP , we will discuss how students can connect their personal goals to tangible outcomes. We will explore college admissions & experience. We will also explore career pathways and outcomes related to engineering and beyond.

## Leadership Workshops

Through workshops & discussions, EIP students will learn more about how their unique personal & academic interest can relate to a possible career future in engineering. These collaborative & engaging workshops will allow students to gain an insight on the academic education, technical training, & unique skill set that engineering professionals utilize in their work role.

## Project Based Learning Team Work

Students will take part in collaborative team projects where we will experience how real world professionals use engineering to solve problems and cultivate solutions. Students will learn the value of teamwork, collaboration and working across sectors in engineering to achieve outcomes.



## Engineering Simulations

EIP students will use the TinkerCAD application brought by AutoDesk to bring project based learning to our virtual program. The TinkerCAD program has lesson plans and applications such as 3D design to build engineering prototypes.



## EIP Group Project

In the EIP group project students will be introduced to the Engineering Design Process & evaluate real world events where the mark has been missed in some cases through what we will call “Engineering Disasters & Deficiencies”. Students will assess whether these cases were a result of a lack of engineering ethics, design flaws, material/equipment failure, and/or environmental conditions. Students will have time to work on their group project each week of the program & will conduct a final presentation during the final week.

# Program Snapshot of EIP Weekly Curriculum

**Evening of June 6th (15 minute Group Timeslot Assigned between 5-7pm)**

## Small Group Meetings: “Getting to Know Each Other & the Program

Two-three days prior to the EIP program, we want to meet individually with students in their research project groups of 4-5 students. This optional 15-minute meeting will give every student the chance to connect personally with staff members as well as their fellow group members in a small environment before the program starts. Students will learn about their group project, meet fellow students, & learn more about 9 weeks together before we begin the main session.

## Orientation for the Engineering Science Immersion Program

The program begins as all students meet their fellow students & EIP staff as we learn about the basic structure of our Engineering Immersion Program. We will cover our core curriculum & provide an overview of these transformative 9 weeks. The students in our program will be from different backgrounds & perspectives, but for this program we will be brought together as a team. We will review our EIP program goals & expected student outcomes. There will also be a presentation about basic aspects of the engineering field that will provide a background to the research, academic & professional aspects of the field.





**Dr. Akua Oppong-Annane**

**“What is Engineering Ethics”**



Teaching Assistant Professor

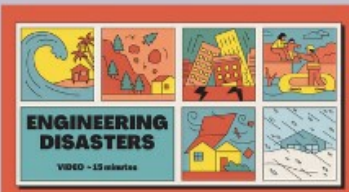
Dr. Akua Oppong-Anane is a Teaching Assistant Professor at West Virginia University. She graduated with a BS in Chemical Engineering, MS in Chemistry and a Ph.D in Environmental Engineering Sciences. Engineers are key decision makers on a lot of projects, from determining how much bolts are needed for a bridge structure to how much funds should be budgeted for a new antennae tower system! During this interactive presentation, students will be divided in groups & provided case studies to evaluate when ethical engineering considerations need to be determined. The goal of this discussion is to think about what you would do, and whether your decision is sound & ethical.

**Why Engineering ?**

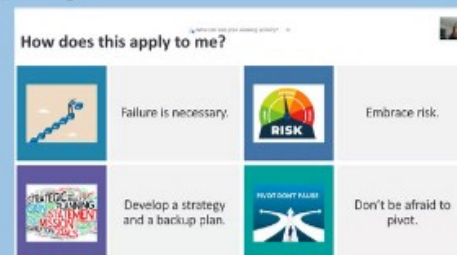
Throughout the program, we will be hearing from our speakers about their unique journeys through college & their careers as they pursued ambitious goals in engineering. Furthermore, students will be exposed to various “Engineering Spotlights” showcasing the various engineering career disciplines via videos, discussions & resources .



**Ahh! What could go wrong?**



Engineers are responsible for various marvels from bridges, sky scrapers, motor vehicles, space crafts, etc. The engineering design process involves the following: asking questions, imagination, planning, creating, and sharing those solutions with others. In the following project, students will be divided into groups and assigned an engineering project that resulted in a disaster or had a clear engineering deficiency.



SATURDAY, June 15th 1pm/4pm PST

**“How do you wanna REACT?”**

**Joe Palmer**

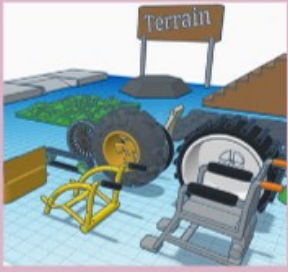
Mr. Joe Palmer holds a masters degree in mechanical engineering & is a mechanical design engineer at the Idaho National Laboratory, which is the Nation’s leading nuclear research laboratory. He designs a variety of nuclear test reactor experiments including both instrumented & non-instrumented experiments. During this presentation students will learn about Mr. Palmer’s 25 years of experience in reactor experiment design, chemical process equipment design, dynamic systems modeling, piping systems, stress & thermal analysis.



Mechanical Engineer, PE



## Engineer Design Process : Wheelchair!



Knowing who your end-user is essential in the engineering design process. EIP students will be using the TinkerCAD program to design their own wheelchairs and see its functionality in difficult terrain. Let your creative juices flow and evaluate the design process and environments in which your wheelchair can be beneficial for your user.



## SATURDAY, June 22nd 1pm/4pm PST

### “Success as an Engineering Student ”

### Todd Hamrick

Hamrick is a mechanical engineer & Teaching Professor in the Fundamentals of Engineering Program at West Virginia University. During his career he served in a broad range of positions including design, product development, tool & die, manufacturing, efficiencies, sales, & management. Hamrick’s teaching style brings practical, innovative, experience based learning to the classroom. He has innovated fundamental courses by adding hands-on projects that reflect real world applications. In this presentation, we will discuss key strategies for success as an engineering student!



Teaching Professor

### Maurice Calhoun

### “LEAP toward your Dreams & Imagination ! ”



Industrial Engineer

Maurice Calhoun is a certified Project Manager, Agile Practitioner, etc. with over 20+ years of experience in the IT industry. He has managed projects with budgets from \$100K - \$20 million and teams from 5 to 400. His background includes designing & developing business & operations process improvement strategies, business & systems analysis/delivery through Process Definitions/Flows, Use Case Models & effective Delivery Management. In this presentation, we will discuss how to leverage your imagination to implement project & change management that can lead to effective engineering solutions!

## The Engineering Design Process

Engineering design is not a one size fits all, and many times you have to REPEAT, REPEAT, and REPEAT! The importance of engineering design is to make observations, ask questions, collaborate, REPEAT, and aim for continuous improvement. EIP students will have an engaging discussion on the engineering design process and connect these concepts with the group project on engineering disasters & deficiencies.





**Are you a shopaholic?**



EIP students will be using the TinkerCAD program to reinvent the shopping cart. Prior to developing their re-imagined shopping cart, students are encouraged to imagine how their design can be an upgrade to the existing carts that we use everyday. An overview of the engineering design process will be discussed and students are encouraged to be inventive during this interactive simulation!



**“Make Engineering Your Superpower - Build a Career You Want ”**

Engineering is an extremely diverse profession. Why is this? Because in an ever changing world, there will never be a shortage of challenges that need solutions. From mechanical engineering to biomedical engineering, there is so much variety in engineering disciplines & how they can be applied to different industries. Through an engineering education you will combine logical, creative & scientific thinking with problem solving to develop a set of skills that are highly valuable. These skills can be leveraged throughout your career to explore a multitude of roles & opportunities. During this discussion, Danielle Holland will walk us through how she has used her engineering background to explore careers in space, finance, animation, & currently, hospitality. Danielle started her career as a software engineer is now a lead delivery manager for a data engineering team. She will share how she maximized her skills to be a marketable candidate for her desired roles and how you can too

**Danielle Holland**



Data Engineer

**SATURDAY, July 6th 1pm/4pm PST**

**Leadership in the Workplace Workshop**



EIP students will discuss the various leadership styles, some they will adopt naturally for themselves & others will be exposed to in the work environment when being managed by senior leadership. Leadership is essential as it is critical in engineering as it pertains to innovation, critical thinking/problem solving, and effective communication. In this interactive session, students will break out in teams & discuss the importance of leadership & communication during a hypothetical plane crash!

**“Let’s have sum PI ”**

Michael L. Clark Pan Advisory R&D Engineer with over 33 years of service at the Idaho National Laboratory. He is currently a Laboratory Manager with responsibility for over 40 material science, bioenergy, & hydrogen electrolysis laboratories performing basic science to demonstration scale industrial operations. He has experience in mechanical design, analysis, simulation, fabrication, system integration, & project/systems engineering. Projects include the design, development, fabrication, commissioning, & operation of remote materials handling equipment and facilities, automated chemical analysis systems, high pressure cryogenic systems, alternative fuel systems, robotics & remote systems, biomass processing systems, & the modification of aircraft airframes. In this discussion student will learn how math and physics applications are vital in the engineering design process!

**Michael Clark**



Mechanical Engineer, PE



**SATURDAY, July 13th 1pm/4pm PST**

### **Office Hours & Conference Calls**



Whether you schedule office hours with your professor and/or send a calendar invite for your job, there are tangible goals that need to be considered when thinking about your post-high school plans. One of the things EIP students will learn to leverage is how networking, volunteering, internships, or conducting research in a lab can provide valuable EXPERIENCE in helping you achieve your goals!

### **“How Do I know which Engineering Discipline is Right for Me?”**

During this session we will have a conversation with Kiana Byrd, who is a Civil Engineer with a focus on transportation and infrastructure projects. Kiana will discuss her experience as a college student, entering the workforce after college and life as a Civil Engineer currently working as a Project Manager for PONT Engineering as a sub consultant for the Georgia Dept. of Transportation. Kiana is responsible for managing & coordinating the complete life cycle of bridge replacement projects. She plays a key role in project planning & execution, working closely with team members, team leads, & stakeholders to ensure a smooth project implementation.

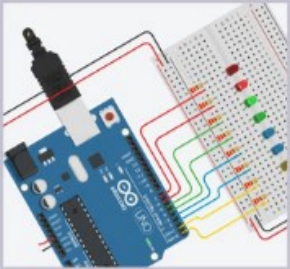
**Kiana Byrd**



Civil Engineer

**SATURDAY, July 20th 1pm/4pm PST**

### **Lights, Camera, ACTION!**



EIP students will learn the basics of using the Tinkercad Circuits interface to build a simple battery-powered LED circuit, connect it to an Arduino and program it to blink the LEDs. At the conclusion of this simulation activity, students will apply what they learned to make their own LED light show!. EIP students will learn best practices for building circuits, and how to debug and troubleshoot their circuits and code.



### **“Fail Your Way to Success: Learning the Necessary Lessons for your Destination ”**

Often in life when we try something new, we encounter tests and struggles. Because it is difficult and we are not immediately successful, many people give up. We are taught that failure is not to be tolerated nor accepted, and that if we fail there are no ‘do-overs’. We are not taught that failure is part of the process of success. As a civil engineer, Christina is now working in the field that she both enjoys and that contributes to the common good, however this was not always the case. In this presentation we will examine some examples of success after failure, including Christina’s personal story. Students will examine the lessons to be learned from failure as well as strategies that can be used to develop perseverance and resiliency.

**Christina Quinchett**



Civil Engineer



**SATURDAY, July 27th 1pm/4pm PST**

**Irene Donaldson**

**“Project Magic!”**



Irene Giovenco Donaldson has a Bachelor’s in Biological Sciences with a minor in Chemistry. with 18 years of experience environmental field . She is currently a Senior Project Manager at Ecotech Environmental Services, Inc., and has worked with a variety of engineers & has mentor dozens of interns & students from a variety of academic fields on how to be a field hydrogeologist. Along with hiring personnel, Irene also manages approximately \$1.5M in environmental clean-up projects across Florida. Irene will discuss how engineering is interdisciplinary, & touch on financial literacy & return on investments (investing on education, options outside of traditional higher level education), and how employers see other avenues of experience as it correlates to compensation to salary, benefits, pros/cons, etc.

**“Marathon to your Financial Fitness Goals!”**

**Omarrah Reid-Christie**

Omarrah Reid-Christie is an entrepreneur dedicated to helping families establish generational wealth through financial literacy, especially those in middle-income and underserved communities. She advocates for a thorough understanding of financial management, including budgeting, saving, investing, credit management, & life insurance. Recognizing the complexities of today's financial environment, Omarrah emphasizes the necessity of these skills for achieving financial stability & bridging economic disparities.



Financial Manager

**SATURDAY, August 3rd 1pm/4pm PST**



**Wrap Up & Final Presentations**



EIP final week will begin with a reflection on speakers, workshops & activities. A discuss on how student perspectives have shifted and how they can take concrete actions moving forward to find success with their new goals will ensue. Students will be given 15-20 minutes for group project presentations, on the topic of engineering disasters & deficiencies. A completion certificate will be provided to students with good attendance via email. We hope to keep in touch with some of our E-SIP students in the months and years to come!

**Bianca Wilson**

Bianca received a bachelor’s degree in civil engineering in 2016. Bianca has a wealth of knowledge in subsurface geotechnical evaluations, Phase I and II Environmental site assessments, bridge replacement, municipality projects and much more. Bianca’s presentation will emphasize the value of perseverance in your academic and career goals and never to bury your dreams!



Civil Engineer

**Final scheduling, workshops/simulations & sequence of speakers is subject to change. Please contact us at [info@impactinternships.org](mailto:info@impactinternships.org) if you have questions about the EIP curriculum.**