JHU NSBE STEM Outreach Project Report:

Objective/Background:

The mission of the National Society of Black Engineers is "to increase the number of culturally responsible Black Engineers who excel academically, succeed professionally and positively impact the community." We started an afterschool high school outreach tailored to helping the students of Baltimore Leadership School for Young Women. We believe this program would help the students succeed in college and life by introducing them to the college environment as well as matching them up with individual undergraduates that can personally mentor them.

Project Summary:

We had 15 interested students and 7students who completed the whole program. We arrived every Thursday afterschool for 2 hours. The program was a semester long and divided into two sections: Engineering Majors and Renewable Energy. The first section was split into 5 weeks and dedicated to Electrical Engineering, Mechanical Engineering, Computer Science, Chemical Engineering, and 3D Printing. The second section focused on renewable energy (solar energy and wind energy). During each week, we divided the 2 hours into 3 parts, an interactive introduction to the field followed by a more structured presentation of the material then a hands-on project session. Snacks were provided during the session.

During the spring semester, we had the students come to the Homewood campus and tour the engineering facilities. The students visited different Engineering Labs in Whiting School, had lunch at the Fresh Food Café and networked with some minority Hopkins Engineers.

Project Results:

Students built products that required the understanding of voltage, current resistors, Ohm's law, series and parallel systems, levers and pulley systems, bridge and tower structures, programing logic (variables, if statements and loops), intro python, chemical mixtures, 3D methods, solar panels, and wind systems. The students made chemical powered cars, tooth pick bridges, different circuit devices (fan, flash light, etc.) Solar powered light, Wind powered light, 3D printed phone cases, Interactive python program, and worked with Arduinos. The students enjoyed the time and upon completion of the program each student received a desktop computer (with the collaboration of the Johns Hopkins Refurbishment Club). The program was a success and each student will be attending a four-year university in majors varying from graphic design, computer science to sociology and history.

What we learned:

We learned a lot with management of afterschool programs and collaborations and communication with high school administrations. This experience is valuable because it will make it easier for the club to establish roots in other high schools. We also learned effective ways of introducing engineering to high school students in a fun interactive way that grows the student's curiosity.

Moving Forward:

We established a great relationship with the Baltimore Leadership School for Young Women and they are excited and look forward to progressing this fall semester. Our goal is to continue in the fall semester with the same school and to possibly expand to other high schools.

Project Pictures:

Attached to the email (video is attached as well)