

BME 402

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Joe

OUTREACH

□ Joe Ferris, Bryan Fondrie, Ashley Huth, and Max Michalski

Our group performed out outreach at Madison West High School on April 22. We presented to a junior geometry class, accordingly we presented in a manner which was not too technical yet provided some detail of engineering to spark interest in biomedical engineering. We covered some of the departments such as chemistry and physics which we have taken as part of our curriculum but did not go into specifics of course names and topics so that we would not overwhelm students with college courses. We were allotted 25 minutes for our presentation but it ran quite a while over that time because we had numerous questions throughout the presentation as well as afterwards. The teacher really didn't limit our presentation except did not want us to take up the entire 50 minute course period which due to questions we almost did but the teacher really appreciated and enjoyed learning about the program. The audience received the presentation better than we had expected and seemed truly interested in the design project even though we had not planned on giving too much detail on the design so as not to get caught up in our project and fail to explain the biomedical engineering program. We were asked about previous design projects and what goes into them which was good because Ashley was able to go into detail about her syringe project which she then explained how she has gone through the patent process with WARF. While we tried to explain the multiple tracks within biomedical engineering it was not very well understood and the crowd seemed to be losing interest. Outreach could be improved by having slides and presentations created for students to present because it would prevent teams from basing their outreach on their project instead of providing an experience for children and young adults to discover details of engineering in an interactive presentation. Additionally, while every semester in BSAC they discuss the amount of paperwork which is associated with the design courses which outreach and this paper could be reduced and just receive the form filled out by the teacher.

We began our presentation by asking students what is an engineer which we simplified to a basic description to provide a background of what we study. This was followed by a discussion of what a biomedical engineer is and how we are a "Jack of all trades." We told them about how biomedical engineering is one of the fastest growing fields and even though they might not have heard of it, it is becoming very popular and a there is a growing demand for biomedical engineers. We discussed the tracks of biomedical engineering which seemed a little over their heads but we each went into detail about our field because we have team members in health care management, biomaterials, and biomechanics and then together we described instrumentation and imaging. In order to give an idea of where a biomedical engineer is needed, we showed some medical processes and the positions in which biomedical engineers intervene and aid doctors through research, products, instrumentation, and tools. In these applications

Max discussed how a biomedical engineer would be important in the development of an artificial heart as well as how biomedical engineers are needed to perform heart surgeries because they have developed ways to reroute and blood and continue pumping while the heart is removed. Additionally, Bryan discussed the role of biomedical engineering in artificial skin. Ashley went into detail about hip implants and how a biomedical engineer is needed because they must understand the forces and stresses on the hip as well as the biological interactions that is presented by the body. We finished discussing some applications by having Joe show a gross picture of a sprinter's leg breaking in numerous places and how a biomedical engineer have invented tools which will be used in the operating room by a surgeon. After applications, we briefly discussed the departments which we take courses in but didn't want to overwhelm students because if they heard that we take bioinstrumentation and biomaterials they may be scared off. The reason we discussed the departments is because when we were in high school may of us thought that the major was extremely biology based because of the name when in reality you take courses in a little bit of all departments and then pick a track in the field you like most. The next part of the presentation when we discussed our project was the most interactive part of the presentation. We stayed away from specific details of our project and tried to emphasize the learning process and how none of us knew how to make a motor work or design projects in Solidworks but through this course we have learned so much in a non-classroom setting. We each were able to describe a previous presentation of ours which sparked a lot of interest by seeing the wide variety of projects we have each worked on. Further, they were interested that we had clients who aren't generally part of the university but outside sources who would like problems solved. We concluded our actual presentation with possible careers for people who major in biomedical engineering. Ashley was able to discuss her route which has led her to medical school next year while Joe discussed the role of a biomedical engineer in patent law and intellectual property. Max discussed industry in biomedical engineering and the variety of companies which hire biomedical engineers because of their broad background and problem solving skills. Bryan discussed a future in academia in which many students truly enjoy what they are studying and make a career of studying and researching while becoming professors. The actual presentation took nearly 30 minutes because of the questions that went on throughout the presentation but then following the presentation we had at least ten minutes of questions because they were very interested in stem cells and all the news they have recently been hearing.

Unfortunately, our presentation was not very hands on regarding props but due to audience participation we made it an interactive session. Our list of props were:

- Powerpoint presentation
- Previous year design poster

The Powerpoint presentation was the main tool utilized in our presentation in which we rotated team members discussing the slides with each individual team member talking in particular about there background, track within biomedical engineering, and possible future career. In order to be able to present a Powerpoint to the math class we contacted

the teacher ahead of time so that they could check out a projector and screen which we then had to arrive early to setup. The poster was used to show our audience a final presentation overview of a previous project but was mainly used to show students that this is something they could do because a couple years back we would have felt like creating a poster like that or making 3D graphics in Solidworks is something we would never be able to do. We weren't able to bring in a physical design because our design project was not completed as well as it contained a sharp razor blade which is forcefully sent forward using a solenoid which is not something we should have in front of a school audience without having completed building everything.