

UNIVERSITY OF SOUTH FLORIDA

BIOMEDICAL ENGINEERING SOCIETY CHAPTER DEVELOPMENT REPORT 2021-2022 Academic Year



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In 2021-2022, the University of South Florida's Biomedical Engineering Society chapter had significant involvement in improving the impact of the biomedical engineering community around Tampa, FL. Transitioning from the fully remote year into an in-person year allowed us to start having in-person meetings, which proved successful. This year, we focused on our research and development groups to help new students familiarize themselves with the mechanics behind Biomedical Engineering. The research and development chairs held multiple workshops, which helped incoming undergraduates prepare themselves for their future curriculum. Not only undergraduates, but workshops such as LTspice helped upperclassmen with preparation for industry work. The USF BMES chapter also built a close connection with AMROC, a Tampa Bay company focused on robotics. The mentorship program added graduate and upper-level students mentoring opportunities to guide graduating seniors into the Biomedical Engineering workforce. The emphasis on building connections within the members itself helped strengthen the bond between undergraduates in BME. We plan to focus on outreach and involvement moving on to help new members become well adjusted to the field of Biomedical Engineering and improve the chapter so that we can better accommodate our members. We also want to work toward collaborating with other organizations at USF and other BMES organizations to help strengthen inter-chapter relations.

Cover Letter

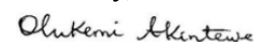
To the Student Chapter Award Committee Members,

The Biomedical Engineering Society (BMES) student chapter at the University of South Florida (USF) completed the 2021-2022 academic year with outstanding achievements. The chapter fulfilled its goal of providing professional development opportunities and resources to USF biomedical engineering students, engineering students, and the local community. Efforts of the chapter's initiatives were recognized and acknowledged by the state of Florida. Members of the BMES R&D team competed at the State Fair Frenzy VEXU State Tournament in February. The team won both the State Tournament Champion and the State Robot Skills Champion awards, achieving the highest skills score in the state of Florida. These achievements are attributed to the USF chapter's culture and its efforts toward building a solid network between students, alumni, faculty, industry, and the community.

Strategic planning of events, resource provision, and implementation of new initiatives were central to this year's success. There are five accomplishments worthy of note: i) The industry outreach committee provided professional development opportunities by collaborating with three industry partners, Boston Scientific, ConMed, and Axogen. Members of the society interfaced with industry representatives regarding interviewing skills, resume writing, job search, and internship opportunities. These experiences provided much-needed awareness and readiness for a BME career; ii) The R&D committee provided four different workshops to engineering students in various academic disciplines. The workshops helped augment challenging concepts faced in major courses from first-year to third-year courses. Specifically, the committee conducted technical training workshops in Arduino wiring and programming, LTspice, BioSignals, and MATLAB. Student engagement in these activities promoted camaraderie. iii) The mentorship program, which started last year to support first-year students and sophomores, continues to be favorable. Mentored underclassmen still rate the program highly, indicating it to be a valuable initiative for the organization moving forward. Thus, the chapter has created resource materials to guide discussions and interactions to help facilitate an effective mentor-mentee relationship. Due to the success of the mentorship program, graduate students are now involved in helping mentor upperclassmen. iv) the chapter had at least five members attend the 2021 National conference in Orlando while two members participated in the poster presentations. With the reduced COVID-19 restrictions this year, the chapter successfully presented an ECG heart rate monitoring device and the VEXU Robot to K-12 attendees of the USF 50th Engineering EXPO, and finally v) the USF chapter significantly fostered team building with outdoor and online activities. The network abilities with faculty and other student organizations help build a strong community. A number of immersive events took place where faculty members and students engaged in Kahoot games and other social interactions. These accomplishments provide an excellent foundation for developing successful future engineering professionals.

In the next academic year, the USF chapter plans to continue to serve its constituents by providing purposeful resources that prepare students for successful biomedical engineering careers.

Sincerely,



Dr. Olukemi Akintewe

Faculty Advisor

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I. Administrative Report

The USF BMES chapter had a remarkable and diligent executive board who worked to provide as many opportunities as possible. The executive board consisted of 11 members; the President, Vice President, Secretary, Treasurer, Industry Outreach Chair, Event Chair, Public Relations Co-Chairs, R&D Competitive, R&D Projects, and Mentorship Chair. Our president, Isabela Zimmerman Rollin, initiated many professional and social events, which helped connect the USF BMES student members. The vice president, Pranith Reddy led many attempts at improving our relationship with other societies at USF and integrating our members into the field of Biomedical Engineering. The Treasurer, Tobias Campos, kept thorough records of all financial matters and handled the annual budget pertaining to events and R&D. Our Secretary, Necol Polynice, kept organized records of the organization, events, and members. Lara de Vries, our Industry & Outreach Chair, was able to get into contact with multiple companies, such as Axogen and CONMED, to urge professional development in our members. Jourban Beaver, our event chair, planned all our events in a spectacular manner. Public Relations Co-Chairs' Srinidhi Manthena and Mahek Khiantani advertised the society's happenings across multiple social media platforms and created merchandise to keep up member enthusiasm. Sean Carr, our R&D Competitive Chair mentored a group of student members to compete and win the VEXU state championship. Jade Houston, our R&D Projects Chair, worked to handle multiple projects which were an interactive way to deal with the field of biomedical engineering. Our mentorship chair, Valeria Carrasquillo, pioneered the mentorship program in the USF BMES chapter. Throughout this year, student members and the faculty of the BMES USF chapter have become closer together and we hope to continue that relationship into the future. We are honored to have such an impressive and devoted board of executive and faculty this year!

II. Leadership Roles and Responsibilities

Position	Name	Email	Roles and Responsibilities
President	Isabela Zimmermann Rollin	isabelaz@usf.edu	preside over meetings, oversee organizational functions, and act as a primary University liaison
Vice President	Pranith Reddy	pranith@usf.edu	assist the President with his/her duties and preside over the organization in the President's absence

Treasurer	Tobias Campos	tobiasf@usf.edu	receive, dispatch, and keep accurate records of all financial matters regarding the organization and submit the organization's annual budget to Student Government for A&S allocation
Secretary	Necol Polynice	npolynice@usf.edu	takes meeting minutes, sends out weekly announcements to members through Bullsconnect, fills out paperwork/forms for the organization, keeps attendance records, runs google drive
Industry Outreach	Lara de Vries	laradevries@usf.edu	reaches out to engineering companies and professionals for potential guest speakers, tours, etc, searches for sponsors by establishing relationships with companies and distributing sponsorship materials
Event Chair	Jourdan Beavers	jourdanb@usf.edu	responsible for planning and setting up for events, including event scheduling, room reservation, and finalizing event dates and times
Public Relations Chair	Srinidhi Manthena	manthenas@usf.edu	makes all posts on social media accounts (Instagram, Facebook, Slack), continually updates the website with short posts about events, etc, comes up with marketing ideas, works with other officers to help produce event flyers, signs, posters, etc.
Public Relations Chair	Mahek Khiantani	khiantanim@usf.edu	makes all posts on social media accounts (Instagram, Facebook, Slack), continually updates the website with short posts about events, etc, comes up with marketing ideas, works with other officers to help produce event flyers, signs, posters, etc.

R&D Competitive Chair	Sean Carr	spcarr@usf.edu	The R&D Competitive chair co-leads engineering workshops with the R&D Projects chair, with a goal to educate students on different softwares and engineering techniques. This chair also leads the robotics team, and aims to increase student involvement in robotics.
R&D Projects Chair	Jade Houston	houstonj2@usf.edu	The R&D Projects Chair oversees projects throughout the term in preparation for the annual Engineering Expo. The R&D Projects Chair drafts multiple project ideas that fit the Biomedical Engineering field, attends all R&D meetings, runs various workshops for students to learn technical skills used in the field of Biomedical Engineering, and is in charge of organizing the organization's Engineering Expo showcase.
Mentorship Chair	Valeria Carrasquillo	vcarrasquil@usf.edu	The Mentorship Chair is responsible for creating and facilitating relationships between mentors and mentees. This chair also creates and provides meeting minutes that mentors can use as a guideline during the meetings with the mentees.

Student Membership

National Membership with BMES as of 5/31/22: 10 members

Total Student Membership in the BMES USF Chapter as of 5/31/22: 440 members

Executive Board Meetings

6/3/21

Discussed what the rules should be for this year (be responsible, on time, organized, etc.) After setting the common grounds, we planned on participating in Bulls Market, where they can show R&D projects and contact information of the club. We also planned on doing an “E-board retreat” where we have different fun outdoor activities.

7/20/21

Discussed Mentorship programs where we will have Alumni Mentorship. We also mentioned how we will reach out to different companies and go to different schools for workshops and tutoring.

8/10/21

After updating and verifying each event, we went on and talked about how we should submit a proposal to the BMES Student Smart Stage. For the R&D, we were also planning to do a co-event with UCF.

9/7/21

Discussed different ways to reach out to more people for competitive R&D. Planned to do an Instagram takeover since we got permission to do so. A lab tour in Axogen

10/20/21

Planned on doing a Halloween-themed event, Friendsgiving, and other social events before the semester end. Discussed doing Scholarships, Solid Work workshops.

11/22/21

Before doing a Friendsgiving, the R&D planned on doing an EMS project, Outreached did the CONMED workshop, as well as talked to Chris McColly since he is the Engineering Recruiter

1/5/22

Planned out different events for the upcoming semester. During the Engineering Expo, we will be showcasing all of our R&D projects. We also ordered storable foods for backup if something were to happen.

2/3/22

Got rooms reserved for upcoming events throughout the month. We also submitted the SG Annual Budget and discussed how we should improve for next year's VEXU. New T-shirt designs were made

3/15/22

Planned out all the food and games for all the different events. The event with Axogen went well and the VEXU won the FL state championship and now waiting to see if we are qualified for World's

3/30/22

Created events for the rest of the semester and ended the year with a social event before finals. Planned elections for the upcoming members were held last Monday. Discussed with Dr. Akintewe whom to reach out to for next year since she is our faculty advisor.

4/7/22

Sent out the election interest forms. Another MATLAB Workshop and discussed what to do with the remaining budget.

4/18/22

Had some issues with the election and only took the votes of those who presented at the election as a solution. Making a ballot for Faculty of the year. We had a banquet, had faculty of the year, superlatives, etc.

4/27/22

We made a welcoming banner for the new officers. We will be having 1:1 with the new members to make sure everyone knows what they are doing. We also ordered some T-shirts and had some leftover budget.

General Body Meetings

9/14/21

After introducing all the eboard members, we discussed each event that will be going on during this semester. After the powerpoint, we just hang out and get to know the newer members

1/20/22

First, we introduced the new and old eboard members, then went on to discuss the social events and workshops that will be happening throughout the semester.

III. Treasury Report

Primary funding for the USF BMES chapter comes from USF Activity and Service Recommendation Committee (ASRC) funds. Applications are submitted through the USF Engineering Council, a committee created to support funding for engineering society projects that may be overlooked when ASRC allocates funds. Fund requests were filled out and submitted by the Treasurer, Tobias Campos, and approved by the USF Student Government board. Use of these funds is only approved for events or items that can be distributed to the entire student body. Limits are in place for amounts of money that can be spent on particular items and where purchases can be made. Majority of the funds were used in our research and development (R&D) team. The R&D funds went towards our VEX U Competitive Robotic Team and toward our Engineering Expo Project Teams. Materials for various future projects were also purchased that will allow the R&D team to expand further into new areas such as robotics and cell culture.

Chapter Expenses Breakdown

Table 1: Overall Expenses

Event	Cost
Elections Ice cream Social	\$143.61
BMES Semester Banquet	\$145.49
BooMES	\$127.16
Comsol Workshop	\$120.00
Ewe Axogen	\$136.00
Friendsgiving	\$73.24
Info Session	\$243.00
Kayaking With BMES	\$491.19
LTSpice Workshop	\$110.80
March Madness	\$126.00
MATLAB Workshop	\$120.00
R&D	
AD8232 Single Lead Double Poles	
Pulse Heart Rate Monitor	\$5.00
Backyard Brains	\$599.97
Basic R&D Components	\$49.62
OLED LCD Display	\$10.88
HC-05 Bluetooth Module	\$37.98
Digital Potentiometer	\$19.32
VEX Parts	\$1,149.00
VRC Tipping Point Full Field & Game Element Kit	\$499.00
Merchandise	
Shirts	\$824.59

Table 2: Overview of Budget

Total Starting Amount	\$5,290.62
Total Spent	\$5,031.85
Total Unused	\$258.77

IV. Chapter Activities

Our chapter worked hard to participate in a variety of activities to promote engagement within our members. We wanted to grow and improve the opportunities that we could provide. As a result, we focused on providing as many professional and social events as possible. With our research and development department, we held multiple workshops intended toward helping student members in future BME endeavors, and we also held social events, such as kayaking, so students could network and mingle. This year, we expanded from one to two R&D groups. While one focused on competing in the VEX U Championship, the other focused on projects that were based on needs in biomedical engineering. With this break into two, we were able to focus on more projects and student members were allowed to choose what they were interested in.

Activity Breakdown

The University of South Florida's Chapter of the Biomedical Engineering Society has two Research and Development (R&D) groups, R&D Competitive, and R&D. The goal of both is in spreading knowledge about the applications of Biomedical Engineering. While one focuses on competitive robotics, the latter focuses on multiple projects utilizing biomechanics, electrical systems, etc.

R&D- Competitive

Under R&D Competitive, a VEX U Robotics team was made to improve and spread the knowledge on robotics, both in BMES members and other students outside BMES or USF, by participating in the VEX U competitions. There were also workshops done on campus, with a goal to educate students on softwares and engineering techniques integral to their classes and majors.

BMES R&D Workshops:

Title	Description	Attendance	Cost
Arduino Workshop	In this workshop, the goal was to educate freshmen, or students who were taking the Foundations of Engineering Lab course, by introducing them to Arduino Uno circuitry, and coding. A powerpoint with information on important lines of code, the structures of the	47 students	\$0 - Students brought their own Arduino kits

	instruments included in the Arduino kit, and sample exercises. The material covered included Arduino components, IDE, the different between analog and digital, breadboard layout, basic circuit components, H-bridge theory, programming motors, ultrasonic sensor wiring and programming, and if/else functions.		
LT-Spice Workshop	In this workshop, a PowerPoint was made and presented, introducing students to the LT-Spice software, and how to utilize it for class projects. The information was prepared such that it would not interfere with professors' curriculums. The material covered included hotkeys, prefixes, spice directives (analysis commands), basic electronic components, voltage source functions, voltage divider circuits, voltage/current/power measurements, analog filters, transistors, and operational amplifier circuits.	16 attendees	\$110.80
Signals Workshop	In this workshop, a PowerPoint was made and presented, going over topics such as Fourier transform theory, Fourier tables, MATLAB fourier transform, amplitude and	14 attendees	\$0

	phase spectra, frequency components of biological signals, noise identification through Fourier analysis, digital filtration of biological signals, analog filtration of biological signals, and transfer functions of analog filters.		
MATLAB Workshop	During the MATLAB workshop, students followed an interactive tutorial that taught and demonstrated some of the various functions and programs available in MATLAB. This included functions, creating graphs and plots to analyze various types of data, as well as how to get around the graphic user interface: command window, file directory, and workspace. This interactive workshop and its corresponding files were made available to students both in person and remotely to provide greater flexibility for those unable to attend or that would like to continue to practice using the program at a later time.	4 attendees	\$0

R&D Competitive: VEX U Challenge

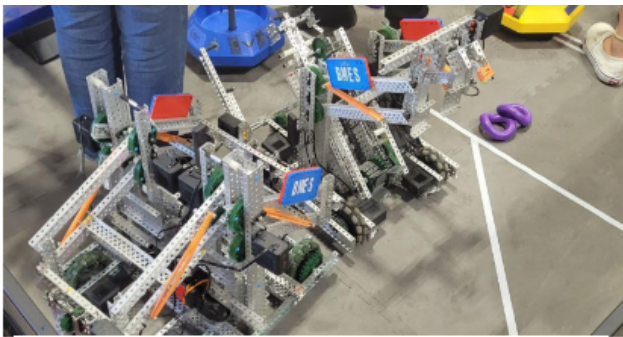
This year’s VEX U Challenge was called “Tipping Point”. It required teams to build and code robots that would collect points by collecting rings, as well as perform other tasks for extra points, such as being able to balance on a see-saw platform. In order to prepare for this challenge, the BMES VEX U team first planned the design of the



robot, built it using VEX Materials from the R&D Chair's past VEX tournament, and coded on the VEXcode V5 software. Each meeting to work on this challenge was scheduled for every Friday, excluding university-appointed breaks. The team worked in AMRoC, a nearby robotics facility.

In order to properly build and code the robots, the team received lessons on different topics in physics and robotics, such as sigmoys, free body diagrams, drive controls, pneumatics, vex code, gearings, and the ability to choose between different materials based on the robots' goals. Such information was useful especially in the building and coding stages, as advancements were being made newly, based on the availability of time and resources. In this time, the team finished the rough design for both of the robots, built their structure, and started testing out the mechanisms to identify which parts can be improved. Coding the robot to be connected to the remote controller was also done, and members of the team began working on the code for the autonomous portion of the match.

There were also scrimmages held against other teams, to prepare for the States Tournament. Example opponents include USF's IEEE VEX U team, and a scrimmage was planned against USF's VEX U team, but was canceled. However, the team used that time to continue to work on the robots. New advancements made during that time include adding new protocols to the code, to pick up a mobile goal in the autonomous section, and improving the gearing for the ring-intake.



BMES's robots participating in the 2021-2022 VEX U Competition

The team went on to win the States Tournament, going against VEX U teams from USF's IEEE, and Florida Polytechnic University, in an event in the Florida State Fairgrounds. To attend this competition, the team and AMRoC spent \$25 . Before and during the match, the team members also spent time explaining the mechanisms and code to children in the fair, with a goal to spread interest and ambition for robotics. Although the team was qualified to move onto the World Tournament, due to the lack of proper funding, they could not attend. The team

continued to work on the robot, focusing more on how they can utilize pneumatics to save power. For the next year, the incoming R&D Competitive chair will apply for VEX grants, and start fundraisers, in order to build a bigger budget for the tournaments. In addition to that, the team will work on developing their building and coding skills, utilizing novel mechanisms, such as pneumatics, to complete the 2022-2023 VEX U challenge.

R&D - Projects

Our chapter currently meets twice a week on a weekly basis to work on biomedical engineering projects in preparation for the annual Engineering Expo. The main goal of our R&D Engineering Expo team is to design and create fun and interactive projects that demonstrate the various applications and skills used in the biomedical engineering field. Such a team is and has in the past been composed of students from various engineering disciplines that collaborate to not only apply their newfound skills learned in the classroom, but also to expand their knowledge and soft skills. This year, the R&D Engineering Expo team had the opportunity to take on one major project: an ECG heart rate monitor wearable device.

For the ECG wearable device, our team worked to design a circuit that was capable of amplifying and filtering noise to acquire a test subject's ECG. This filtered signal was then sent to an Arduino, where computations and code were used to calculate the test subject's heart rate and display their ECG data and heart rate on a mini-LCD monitor. This advanced project required advanced knowledge in electrical circuitry, ECG signal acquisition, and Arduino programming. Such a project provided all team members a challenging opportunity to build and learn new skills. Due to the small size of the R&D Engineering Expo team, all aspects of the project were divided equally amongst members. A circuit has been built and tested that can clearly detect a test subject's ECG signal and heart rate, but our team continues to improve upon the design. Our team is learning how to integrate the current breadboard device to its own soldered integrated circuit as well as design a CAD model for the housing of the electric parts and LCD screen of the watch. Our team is also doing more research to further improve the overall circuit design to reduce electromagnetic noise.

Although we aim to develop an R&D Engineering Expo team that works on current issues in the biomedical engineering field, the current projects of the chapter provide students with a great opportunity to learn new skills. Most members have elected to join a team outside their specific field to broaden their skillset. And our senior members of those teams have provided both guidance and small lessons to help newer and/or inexperienced members get started on tackling such projects.

Engineering Expo

The Engineering Expo is an event hosted by the College of Engineering to inspire K-12 students to study STEM. Our chapter holds a booth every year with interactive games and exhibits to get students excited about biomedical engineering. We usually showcase some of the projects the R&D chapter has been working on. One of our main events this year has been the ECG (Electrocardiograph) Heart Rate Monitor. This is a fun interactive demonstration where one of our team members displays their heart rate on a monitor for students to see. Various exercises and tasks are then conducted by the team member and changes in heart rate and the ECG signal are observed. Electrodes are placed on the team member's chest to acquire the ECG signal and based on the relative timings of each heart contraction; a heart rate can be calculated. This demonstration has greatly sparked students' interest in ECG signals and ECG controlled devices in the field of biomedical engineering.

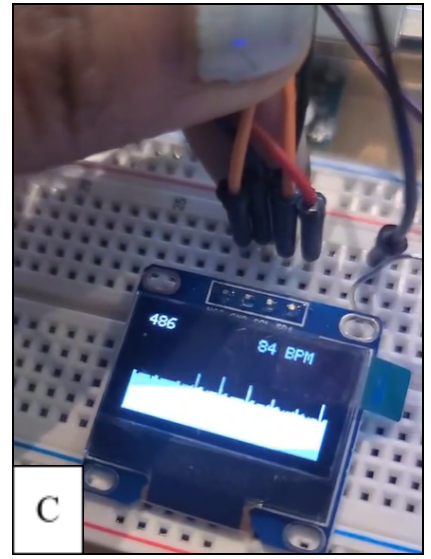
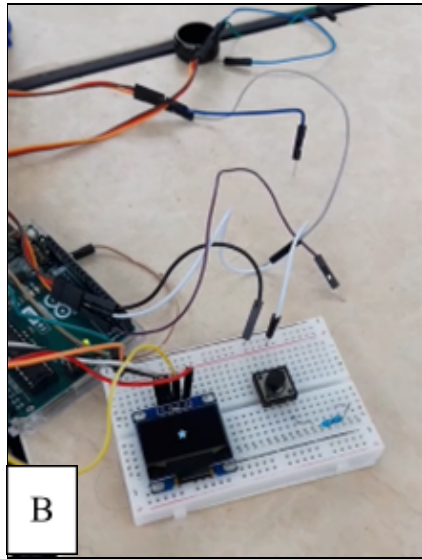
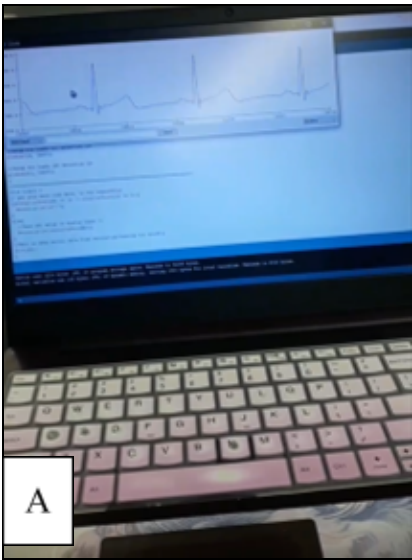


Figure 3: Various images of the progression of the BMES R&D wearable heart monitor (A through C) and showcase at the 2022 Engineering Expo (D and E).

V. Social and Other Activities

Activities Breakdown

Below is a list of all the activities hosted by the University of South Florida's Chapter of Biomedical Engineering Society throughout the 2021-2022 academic year. These activities were hosted by the chapter with the intention of academically educating, entertaining, and informing USF's student population with activities relating to the field of Biomedical Engineering.

Activity & Details	Platform	Attendees	Classification
Kayaking with BMES USF's chapter of BMES year's kick-off. Students gathered in the USF's Riverfront Park and went kayaking, had some food, and got acquainted with one another. ➤ August 28th, 2021	In-Person	35	Entertainment Outdoors Recreational
Mentorship Program Info Session Info session held virtually by USF's chapter of BMES to inform student population about upcoming mentorship program. ➤ September 8th, 2021	Online - Microsoft Teams	12	Education
September BMES Info Session Info session meant to introduce the current BMES board members and inform students about upcoming semester plans. ➤ September 14th, 2021	In-Person	54	Meeting
BMES Friendsgiving Picnic potluck with thanksgiving-style dinner, music, and games. ➤ November 23rd, 2021	In-Person	15	Entertainment Outdoors
BMES Information Session and Social Information session hosted by USF's chapter of BMES to discuss semester goals, plans, and events. ➤ January 20th, 2022	In-Person	30	Meeting
BMES Kayaking Game day and kayaking with USF's chapter of BMES in USF's Riverfront Park. ➤ January 30th, 2022	In-Person	35	Recreational Outdoors Entertainment

Mentorship Info Session Info session for USF's chapter of BMES's mentorship program. ➤ February 2nd, 2022	Online - Microsoft Teams	3	Meeting
BMES Study Social Hangout and study with USF's chapter of BMES. ➤ February 3rd, 2022	In-Person	11	Education
Evening with and Engineer Evening with an engineer from Axogen presenting their work and everyday life as an engineer. ➤ February 28th, 2022	In-Person	24	Education
BMES March Madness Game night and group study hosted by USF's chapter of BMES. ➤ March 9th, 2022	In-Person	18	Wellness
Ice Cream Social Event to provide students with information about USF's chapter of BMES's plans for the upcoming academic year. ➤ April 4th, 2022	In-Person	37	Meeting
BMES Semester Banquet USF's chapter of BMES's year wrap-up. Outdoor activity. ➤ April 20th, 2022	In-Person	15	Entertainment Faculty Outdoors

VI. Inter-Chapter Activities

Due to COVID-19, the USF BMES chapter could not hold many Inter-Chapter Activities. As these are unique and unexpected circumstances, we were unable to form as close of a bond with other societies as we would have hoped. We were able to hold one workshop with the Society of Asian Scientists and Engineers pertaining to MATLAB software. In the future, we plan to have a variety of events with multiple societies in the USF campus to form a closer bond around campus. We also plan to have events with other BMES organizations in hopes that we can form stronger connections and network with other chapters.

VII. Outreach Activities

It is a strong belief that BMES should be thoroughly involved with its surrounding communities. As being a relatively new established chapter, we have not had the opportunity to get as involved in our community as much as we would like. Through one individual, BMES has been able to initiate one connection with a local elementary school. With this, kids were taught basic mechanical and software engineering principles; these kids were even able to take what they learned and apply it in a few competitions. We are actively working to continue to establish initial connections with our local communities like this. These connections will set the foundations for future collaboration between BMES and our communities. To foster continual growth and success of this initiative, we look forward to continuing projects like this and creating even more events that provide young children with access to the STEM field.



VIII. Mentoring Activities

The mentorship program is a great way for members of BMES to connect with fellow members, stay involved and give back to the organization. For mentees in particular, the mentorship program helps with attaining personal, professional, and academic success during their time in the USF BME program. This year, the mentorship program allowed mentors to not only be upperclassmen but also graduate students and alumni. This resulted in a total of 15 mentors with 2 mentees each, with mentor-mentee pairs determined based on shared academic and career interests. In the future, we hope to expand the mentorship program to include more mentors and mentees, both from BME and other relevant engineering backgrounds.

Mentoring Activities Breakdown

Besides the activities listed in the table below, all mentors met with each of their mentees four times during the year (twice per semester), and mentees could schedule more appointments with their mentors if needed. Meeting agendas containing suggested talking points were provided from BMES to mentors prior to the meetings. Suggested topics included the different branches of biomedical engineering, student organizations, research and internship opportunities, campus life, stress management and tips for academic success.

Event	Date	Attendance	Description	Cost
Mentor Training	9/8/21	12	Virtual event that aimed to explain to mentors their role and provide tips to help them succeed as mentors	\$0
Mentor Training	2/2/22	3	Virtual event that aimed to explain to mentors their role and provide tips to help them succeed as mentors – geared towards new mentors that joined during the Spring semester	\$0

IX. Industry and Professional Development

BMES recognizes the importance of hosting industry and professional development events for its members. The aim of these events is to prepare students for industry, to set and build foundational networking skills, and to connect students with professionals for internships or other work opportunities. We are committed to providing access to the necessary resources to promote professional development and success for its members in the biomedical industry.

Industry/PD Activities Breakdown

Evening With an Engineer [EWE]

BMES offers special opportunities for undergraduate students to participate in conversations with engineers from various companies. The purpose of the evening is to give students the valuable opportunity to hear what is happening now in the industry. Students are enlightened on real world engineering experiences and their knowledge of the field is broadened. In this evening, students are also provided an interactive presentation that explains what the special guest does day to day. Additionally, by the end of the evening students of all levels are given the exclusive chance to initiate or further develop relationships with engineers. Overall, the evening encourages networking and professional development for the students.

EWE Featuring Rachel Llewellyn from Boston Scientific	September 20 th , 2021	11 Attendees	Cost:
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EWE Featuring Dr. Ben Spearman and Dr. Nesreen Alsmaldi from Axogen	February 28 th , 2022	24 Attendees	Cost: \$136
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Workshops

These workshop events are intended to expose freshman and sophomores to essential subjects taught in the biomedical engineering program. They are also available to upper-level division students who would like to refresh their memory or strengthen their skills on the pertaining topic. In addition to these highlights, these workshops provide volunteering opportunities for the students who are already proficient in the skill to help the attendees.

Arduino Workshop	September 30 th , 2021	47 Attendees	Cost:
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Signals Workshop	October 28 th , 2021	14 Attendees	Cost:
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LTSpice Workshop	March 10 th , 2022	16 Attendees	Cost: \$110.80
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MATLAB Workshop	April 4 th , 2022	4 Attendees	Cost: \$0
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Professional Workshops

BMES regularly hosts professional workshops to help ensure the proper foundations are set for the success of each one of its members post college. BMES invites and works with neighboring biomedical engineering companies to provide the necessary workshops to help students to get started on professional development if they haven't already. We also host events where students can get formative feedback on their networking skills and professional development.

Interview Workshop with CONMED	November 15 th , 2021	10 Attendees	Cost:
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X. National BMES Meeting

Annual Meeting Experiences

Due to COVID-19, students who wished to participate in research to be able to present at the BMES annual meeting in 202 could not . One presenter, Sean Carr, our R&D Chair, was able to have the opportunity to present at the BMES Annual meeting as an oral presenter. In his research, he developed a proportional-integral control algorithm that evaluated participant step length asymmetry and adjusted the split-belt ratios in real time to achieve a target asymmetry during training and symmetry after training. Two of our members also volunteered at the event, Necol Polynice and Pranith Reddy. They all described the experience as unique and enriching! Next year, we hope to send more presenters and more volunteers so more members can also experience the event and have a chance to showcase their projects.

Expectations and Goals

Our goals for the National BMES Meeting were to send multiple people so that many others could have experienced the Meeting. Although we wanted more people to attend the National BMES Meeting, we are happy that Sean was able to present and we are proud of him. Next year, we hope to send more presenters and more volunteers so more members can also experience the event and have a chance to showcase their projects.

Presenters and Awards

Sean Carr, our R&D Chair, submitted and presented his work in an oral presentation at the Annual Meeting in 2021. He presented on split-belt treadmill training in which he developed a proportional-integral control algorithm that evaluated participant step length asymmetry and adjusted the split-belt ratios in real time to achieve a target asymmetry during training and symmetry after training. Through his experience in the meeting, Sean was able to network with professionals and graduate school recruitment teams. At the meeting, he also spent time with fellow USF BMES chapter members, and got closer to them and the chapter as a whole.

XI. Future Directions

Goals Achieved

We are fortunate to have achieved the goals previously set for our chapter. With the new additions to the R&D division, our VEX U team qualified for the VEX U Challenge World Tournament. We were able to provide our members with many opportunities including the Evening with an Engineer, workshops, and the mentorship program. This year was the first year in which the mentorship program was fully integrated into the USF chapter. We were able to have students from all levels participating, including graduate students who were mentors to the upper level students.

Expectations for the Coming Year

The USF BMES e-board will work hard to ensure that the coming year will be a successful year. The expectations and goals are to carry out events that create a positive and welcoming environment while informing others about the field of biomedical engineering. Our goal is to assist fellow students in this field with opportunities, advice, mentoring, tutoring, and more. A big focus point for the upcoming year would be to increase the advertisement for our events to increase the participation. We want to expand the mentorship program from being a primarily online program (due to COVID), to having in-person events centered around the mentorship program in hopes of creating connections within the BMES community. A variety of events will be hosted that will aid the members in different ways including workshops, events centered around building connections, and group study sessions. We plan to be more active and develop the social media accounts to increase engagement on both, social media and in-person events. Although the USF BMES chapter does have a website, it has not been updated in a while. The e-board for the upcoming year will be continuously updating the website to keep up to date with all the events. Overall, our expectations for the upcoming year are to increase engagement throughout the different aspects of the USF BMES chapter.