

Chapter Development Report

University of Delaware

Biomedical Engineering Society

Graduate Chapter

2020-2021

Contact Information of Submitting Party:

Elise Hoover - President

Phone Number (mobile): (703) 851-7162

Email: ehoover@udel.edu

Faculty Advisor:

Dr. John H. Slater

Phone number (office): (302) 831-6541

Email: jhslater@udel.edu

CDR Summation:

The University of Delaware Graduate Biomedical Engineering Society consists of a group of graduate students with diverse research backgrounds and skill sets bonded together by the shared, strong desire to promote biomedical engineering interests and foster STEM education at the University of Delaware and to the surrounding Greater Delaware communities. The purpose of this organization is to foster relationships between those University of Delaware graduate students who are interested in Biomedical Engineering, the University of Delaware, and the greater Delaware area. The UD Graduate BMES worked diligently in the areas of Social, Outreach, and Mentorship activities in the 2020-2021 year. We pride ourselves on being a family-like community, and our frequent social activities help maintain this supportive community and provide opportunities for members to reach out to one another in times of need. Our Outreach chairs and volunteers organized and participated in three separate outreach events/programs each promoting STEM interest and education in two different Delaware elementary schools. An exciting development for our chapter was the creation of a program that continually matches undergraduate students and graduate students into mentoring pairs, dictated based on a combination of mentorship needs/styles and personality. We had good representation of our Chapter at the virtual 2020 BMES Annual Meeting, despite the challenges presented by the COVID-19 pandemic, where more than 20% of our members presented a poster or gave an oral presentation. We are continuously motivated to develop our chapter into an outstanding example of the National BMES's mission: to promote and enhance knowledge and education in biomedical engineering and bioengineering worldwide and its utilization for human health and well-being. In the coming years, we aim to continue our strong existing efforts in Social, Outreach, and Mentorship activities, but also work fervently to establish programs to strengthen our Inter-Chapter and Societal Impact Activities.

June 1, 2021

**Biomedical Engineering Society (BMES)
8201 Corporate Drive, Suite 1125
Landover, MD 20785-2224**

To the Student Award Committee Members,

Over the past several years, the graduate department of Biomedical Engineering at the University of Delaware has grown substantially since its infancy in 2012. Alongside this growth, a graduate chapter of BMES was formed to foster an overall goal of mentorship, social engagement, and outreach at the university and in the greater Delaware area. In 2020-2021, we set out to accomplish several goals. First, we sought to create a symposium series for the graduate students in our department to introduce their research to a room of their peers and faculty members. The symposium would conclude with a panel of industry professionals. Second, we sought to generate and foster opportunities for chapter outreach with several elementary/middle schools in the Delaware area. Third, we established a mentorship program with the undergraduate BMES chapter.

To better communicate the research within our department, we outlined a graduate symposium series through our chapter. The resultant series consisted of 15 speakers in total, in various stages of their graduate degrees. Constructive feedback was provided by the audience to the presenters about their content and communication style. The event was attended by ~50 people not only in our department, but also the chemistry, chemical engineering, biological sciences, and mechanical engineering departments. Following the symposium, UD BME alumni who currently work in industry were invited to join a panel and discuss their various roles as well as the job application process. We are organizing both events again in the future due to overwhelming support and through a newly appointed BMES graduate symposium chair.

Other chapter highlights this year include the continued outreach going on with several schools in the Delaware area, including Serviam Girls Academy in New Castle, DE, as well as Brandywine Springs School in Wilmington, DE. We have several interactive lectures and programs including STEM demonstrations, where members of our chapter and others use modules to illustrate different engineering disciplines using fun activities, as well as virtual math tutoring. Future directions of our chapter include further implementation of our mentorship program with the undergraduate BMES chapter to assist in their professional development activities and provide support as they expand their own activities and events.

The UD Graduate BMES chapter would like to thank the national BMES organization for its unwavering dedication to promote undergraduate and graduate student growth and developing connections within the biomedical field.

Sincerely,

Elise Hoover

Ph.D. Student

Graduate Student Chapter President

ehoover@udel.edu

John H. Slater, Ph.D.

Assistant Professor

Graduate Chapter Advisor

jhslater@udel.edu

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IV. Administration Report

IVa. Abstract of Administrative Report

The University of Delaware Biomedical Engineering Department has research areas focusing on musculoskeletal biomechanics, drug delivery and nanomedicine, cell and tissue engineering, disease modeling, and neuroengineering and rehabilitation. Due to our diversity in research, our graduate students' interests and skill sets vary across science and engineering disciplines. The UD BMES graduate chapter uses the umbrella term of biomedical engineering to link our diverse community of engineers into one cohesive organization focused on outreach, mentorship, community, and promotion of biomedical engineering education. In the following Administration Report, the Executive Board officers and corresponding duties, chapter membership breakdown, and meeting dates and agendas are provided in detail.

IVb. Executive Board Officers

Officer Position	Member Name and Email	Officer Responsibilities
President	Elise Hoover ehoover@udel.edu	<ul style="list-style-type: none">● Lead meetings and help fellow Executive Board and position holders to complete their tasks● Manage all relations with the public or University of Delaware
Vice President	Hannah Cohen hncohen@udel.edu	<ul style="list-style-type: none">● Help the President run the organization by advising and assisting the President● Help position holders fulfill their duties to this organization● Compile information, write, and submit Chapter Development Report to National BMES
Secretary	Cody Helm cahelm@udel.edu	<ul style="list-style-type: none">● Record minutes and take attendance at each meeting● Sending emails to the entire organization regarding meeting times and minutes● Maintain and update a list of active members of the organization
Treasurer	Alexa Diano adiano@udel.edu	<ul style="list-style-type: none">● Responsible for all group expenditures, revenues, bank account, signing checks, and group ledgers● Create and update budget with plans for using/adding to any funds● Collect all dues owed and tabulate usage into the annual budget
Outreach Chair(s)	Cailin Gonyea rgonyea@udel.edu Lily Lin lilymlin@udel.edu	<ul style="list-style-type: none">● Organize events that engage in outreach to the University of Delaware and Greater Delaware area to garner interest in the sciences and Biomedical Engineering

Mentorship Chair(s)	Mary Kramer mkkramer@udel.edu Emily Lambeth eplambet@udel.edu	<ul style="list-style-type: none"> Organize, promote, and maintain a mentoring program between the graduate and undergraduate BMES chapters Act as the primary source of contact to the undergraduate BMES chapter
Webmaster/ Social Media Chair	N'Dea Irvin-Choy irvinchn@udel.edu	<ul style="list-style-type: none"> Set up and maintain a public website Add all events to the website calendar and advertise all events on the website in accordance with University guidelines Run and create content for the official UD BMES website, Instagram, and Twitter
Symposium Chair	Connor Virgile cvirgile@udel.edu	<ul style="list-style-type: none"> Plan bi-annual Seminar Symposium held for the BME Graduate students Organize presentations, schedules, and presenters for symposium
Social Chair	Diego Caban-Rivera dacr@udel.edu	<ul style="list-style-type: none"> Organize and promote events that engage the members in settings that are social and/or educational

IVc. Membership

	BMES Members	Graduate Students in BME Department	% Graduate BME Students in BMES
Active Chapter Members	30	56	54%
National Members	20	56	36%

IVd. Executive and General Body Meetings

Date	Attendance	Agenda
1/9/20	19	Updates on outreach events, held elections for Executive Board positions
2/13/20	13	Discuss the success of the Graduate Symposium run by our new/old chairs, upcoming outreach event discussion, update on creating upcoming SolidWorks lectures in coordination with Dr. Corbin's classes, GSO budget with GSG discussion
3/12/20	N/A	Cancelled due to beginning of COVID-19 quarantine
4/16/20	22	Virtual meeting due to COVID-19 quarantine → update on CDR status, discuss any outreach that can be done virtually, status update on member physical and mental well-being during pandemic

5/21/20	18	Virtual meeting due to COVID-19 quarantine → Update on CDR status and intent to submit, brainstorming inter-chapter activities for 2020, discuss potential of inter-chapter food drive, coffee hours planned to be held over Zoom, seminar chair update on status of seminar (virtual or in person; TBD)
8/13/20	15	Virtual meeting due to COVID-19 quarantine → discussing national BMES annual memberships, survey members availability for scheduling general body meetings, brainstorming potential ideas for outreach events for the Fall, update on interview preparation workshop for BME undergraduates
9/10/20	25	Virtual meeting due to COVID-19 quarantine → developing SolidWorks tutorial videos for undergraduate chapter, brainstorming potential virtual social event ideas, update on assembling goodie bags for local middle school students, update on mentorship matching program with undergraduate BMES chapter
10/8/20	22	Virtual meeting due to COVID-19 quarantine → update on care packages for middle students, discussing interview workshop event for undergraduates, sent out form to gauge interest in upcoming virtual social events
11/13/20	18	Virtual meeting due to COVID-19 quarantine → discussing potential inter-chapter food-drive, feedback on technical interview workshop and interest in graduate student panel event in December, virtual upcoming canvas painting social event
12/11/20	28	Virtual meeting due to COVID-19 quarantine → discussing Executive Board elections taking place in January, update on graduate panel mentorship event, update on virtual social event for January
1/15/21	30	Virtual meeting due to COVID-19 quarantine → held elections for BMES exec board positions, discussing Executive Board transitions
2/11/21	11	Virtual meeting due to COVID-19 quarantine → Executive Board meeting to discuss goals and plans for Spring 2021, forming committees to help with executing events, brainstorming ideas for outreach, mentorship, and social events, BMES winter symposium update
3/12/21	25	Virtual meeting due to COVID-19 quarantine → voted on Constitution amendments for the BMES chapter, update on outreach event with Brandywine middle schoolers, update on mentorship matching program for the spring and interest in mentorship events, upcoming virtual baking social event
4/9/21	17	Virtual meeting due to COVID-19 quarantine → planning a mental health seminar in the Fall, update on assembling supply bags for

		middle schoolers, update on mentorship matching pairs, upcoming zoom coffee hour event
5/14/21	12	Virtual meeting due to COVID-19 quarantine → update on CDR status and intent to submit, planning an outreach event with the girl scouts, looking for volunteers for undergrad mini-conference, seminar chair update on scheduling industry panel for summer symposium

V. Treasury Report

Va. Abstract of Treasury Report

The UD BMES Graduate Chapter Treasurer has tabulated the chart below that lists the deposits and withdrawals made with BMES funds from 2020 to 2021 (current date). Membership dues are \$5.00 and to be paid to the Treasurer by an established deadline biannually to guarantee Active Member status. The majority of our funds have been spent to purchase food and drink for our various Social Events or materials for Outreach purposes. We have only received external funding from one source during this CDR's period, as can be seen detailed (*) in the chart below. We did not hold any fundraising events for our BMES chapter in the 2020-2021 year. National BMES has not provided our chapter with funding.

Vb. Chapter Expenses Breakdown

Event/Expenses	Date	Deposits	Withdrawals
Member Dues - Fall 2020	11/01/2020	\$135.00	
Social Event - Bob Ross Canvas Night	12/01/2020		\$113.29
Graduate Student Organization Funding from Graduate College*	12/17/2020	\$100.00	
Social Media Giveaway	02/24/2021		\$30.93
Social Event - Baking Night	03/27/2021		\$80.04
Outreach - Brandywine School	05/06/2021		\$20.53
Member Dues - Spring 2021	05/20/2021	\$95.00	
Social Media Giveaway	05/22/2021		\$54.00
Social Media Content Sponsorship	05/24/2021		\$43.00

**Note: This \$100 sum was an external fund provided to the BMES Chapter by the University of Delaware Graduate College after we applied and established ourselves as a Registered Graduate Student Organization at the University of Delaware.*

Balance Sheet

The UD BMES Grad Chapter funds account is carefully maintained and budgeted by the Chapter Treasurer. The balance sheet for the account is as follows:

UD BMES Grad Chapter Account 2020-2021 School Year	
Beginning Balance <i>(Prior to 6/1/2020)</i>	\$1,441.11
Withdrawals <i>(6/1/2020-present)</i>	\$341.79
Deposits <i>(6/1/2020-present)</i>	\$330.00
CURRENT BALANCE <i>(as of 6/1/2021)</i>	\$1,429.32

Vc. Chapter Fundraising

The UD BMES Grad Chapter received \$100 from the University of Delaware due to our standing as a Registered Graduate Student Organization. There were no other fundraising efforts in the 2020-2021 school year.

VI. Chapter Activities

Via. Abstract of All Chapter Activities

Graduate BMES members participate in a variety of outreach and mentorship activities with the goal for members to engage in leadership opportunities and communicate how biomedical engineering and broader STEM professions can impact society. We encourage our members to enrich the University of Delaware community with STEM education and mentorship opportunities. Our chapter seeks to impact our society through positive interactions with undergraduate students at UD and K-12 organizations in the Delaware community, such as with STEM activities with younger students during outreach events. Beyond promoting and strengthening interest in STEM education throughout the external community, our chapter finds it extremely important to strengthen our member's interpersonal skills and ensure happiness and wellbeing. We host a variety of social activities to ensure our members have opportunities to socialize outside of research and professional settings in a more comfortable atmosphere with peers they can trust and confide in. UD BMES prides itself on maintaining a strong community to ensure the well-being of its members, and utilize this strong support system to help launch our members into successful industry and research careers.

The following sections (VII, IX, X) provide detailed analyses for our Social, Outreach, and Mentoring activities for the 2020-2021 year to date of this CDR's submission:

VII. Social Activities

VIIa. Abstract of Social Activities

The goal of the Graduate BMES Social Activities is to foster and forge a greater sense of community amidst the BME graduate student society. Our social events intend to expand the BMES members' relationships beyond colleagues and into friendships with the added benefits of a support system available during the stressors of graduate school. BME members outside of BMES are also encouraged to attend events with the intent of not only creating more friendships, but also marketing our organization to non-member students and encouraging future membership. Our social events create an environment of comradery in and outside of the school/work environment, which helps students bond and relieve stress.

VIIb. Social Activities

Halloween Movie Watch Party:

Virtual movie watch party each night leading up to Halloween, hosted by our social chair for BMES members to enjoy each other's company while tuning in to halloween hits.

Date	Audience	Attendance	Cost
10/26/2021-10/30/2021	BMES members	8 graduate students	N/A (no cost)

BMES-sponsored Zoom Bob Ross Canvas Night:

Virtual painting event, Bob Ross themed, sponsored for BMES members. Our social chair provided paint, brushes, and other supplies to make it possible.

Date	Audience	Attendance	Cost
11/13/2020	BMES members	10 graduate students	\$113.29

BMES-sponsored Zoom Biscotti Baking Night:

Chapter-funded biscotti baking class for BMES members, where participants were supplied ingredients to make two biscotti recipes from scratch while socializing virtually through zoom.

Date	Audience	Attendance	Cost
03/27/2021	BMES members	8 graduate students	\$80.04

Gathertown Virtual Happy Hour:

Our social chair provided a space to gather and socialize in a virtual environment (Gathertown) to discuss research, life, and provide a community-feeling for our BMES members

Date	Audience	Attendance	Cost
04/16/2021	BMES members	8 graduate students	N/A (no cost)

VIII. Inter-Chapter Activities

VIIIa. Abstract of Inter-Chapter Activities

As of June 1, 2021, our BMES Chapter has not hosted or participated in an inter-chapter activity with another BMES student chapter. In the 2020-2021 BMES year, we were working towards creating a better line of communication and relationship with our BMES undergraduate chapter at UD. UD has two organizations for BMES, a graduate chapter Graduate Student Organization (GSO) and an undergraduate chapter. Our efforts in 2020-2021 hoped to link the two groups together and work more cohesively. Prior to these efforts however, our BMES undergraduate chapter underwent the absence of an advisor during a transition of the role to a new faculty member towards the end of 2018-2019. Therefore, we held various meetings with the new BMES undergraduate chapter to assist in creating a stronger and more resolute BMES undergraduate chapter. Due to our involvement with establishing a better BMES undergraduate chapter at our own university, we did not reach out to other BMES graduate chapters for inter-chapter events. However, especially after the social distancing and isolation protocols due to the COVID-19 pandemic, our chapter is invigorated to pursue inter-chapter events with neighboring universities, such as the University of Pennsylvania.

IX. Outreach Activities

IXa. Abstract of Community Outreach Activities

The outreach program set forth by our UD BMES graduate chapter focuses on organizing events that engage in outreach to the University of Delaware and Greater Delaware area to garner interest in the sciences and the field of Biomedical Engineering. The Outreach Chairs are expected to organize at least 1 outreach event per semester, and the outreach events must be organized through BMES as BMES sponsored or co-sponsored events. One of our goals is to inform the public, especially the younger generations, about what it means to be a real-life “scientist” or “engineer,” and that this strays from the stereotypical images seen in movies or TV shows. It is also our interest to inspire young minds to be interested in STEM topics, teach them how to question ordinary phenomena around them, form hypotheses, and investigate to understand this phenomena. Through our outreach program, we provide a community of young minds and their guardians with a deeper understanding of what being a biomedical engineer, scientist, or STEM professional truly entails.

IXb. Community Outreach Activities

Serviam Girls Academy Tutoring:

BMES members worked virtually with Serviam Girls Academy to host weekly tutoring sessions in partnership with University of Delaware’s Women in Engineering (WiE) Enrichment Program.

Date	Activity description	Attendance	Goals	Outcomes	Cost
9/1/20-5/15/21	Virtual math tutoring	10 BMES members 10 students	Partner with WiE to improve middle schoolers’ understanding of math concepts	Provided one on one mentorship, math help, and role modeling for minority middle school students	N/A

Serviam Girls Academy COVID Care Packages:

BMES members partnered with University of Delaware’s Women in Engineering (WiE) to put together care packages to assist in virtual/at-home learning.

Date	Activity description	Attendance	Goals	Outcomes	Cost
11/16/20-11/19/20	Care package assembly	8 BMES members	Partner with WiE to put together care packages for at-home learning	Provided care packages for middle school students that included school supplies and encouraging notes	N/A (covered by WiE)



(11/16/20): Some of the supplies included in the care packages included basic school supplies and some UD BME branded merchandise.

Brandywine Spring School Outreach Events:

The UD BMES Grad Chapter has a great and active relationship with the Brandywine School District. In previous years, BMES members have travelled to their school to host STEM activities of various kinds to help instill interest and motivation to pursue STEM education and career paths in young people. Due to the social distancing regulations this year, our two Outreach Chairs hosted a virtual event on Zoom to help get the students excited about biology, nature, and life cycles.

Date	Activity description	Attendance	Goals	Outcomes	Cost
5/3/21	Butterfly Life Cycle Activity	2 BMES members 33 students	Students learned about the butterfly life cycle and made a paper plate life cycle diagram by adding different pasta pieces representing the different stages of the life cycle.	Students learned about basic biology and were shown the importance of making observations about the world around them through our butterfly life cycle lesson. We also introduced them to biomedical engineering and discussed its role in the real world.	\$20.53

X. Mentoring Activities

Xa. Abstract of Mentoring Activities

The goal of our mentoring program is for BMES graduate members to lead by example and to educate our UD community members. We have created a new mentorship program with the University of Delaware undergraduate chapter of BMES to form closer mentor-mentee based relationships between graduate and undergraduate students. This partnership with the undergraduate chapter is further strengthened by coordinating co-sponsored events, as well. By fostering these relationships, our BMES members have the opportunity to lead by example, strengthen interpersonal skills, and support students in their educational journey in a more customized manner than the general curriculum allows.

Xb. Mentoring Activities

Undergraduate Mentorship Partnership

Our chapter partnered directly with the University of Delaware's Undergraduate BMES chapter (a newly formed chapter within the past two years) to assist with some of their events and hold panels/workshops at their chapter meetings or as separate events for the undergraduate students to attend.

Event Date	Topic	Description	Undergraduate Sign-ups	Graduate Sign-ups
10/16/20	BMES Mentorship Introduction	Graduate and undergraduate mentorship pairs were informed of expectations of mentorship and provided resources and icebreakers to aid in forging relationships within and between pairs	8	6
10/27/20	Technical Interview Prep	Recently graduated undergraduates described some of the technical questions they were asked during job interviews. Graduate students then collated questions into a presentation and provided resources for answering and practiced answering challenging technical questions	12	7
5/18/21	Grad School Panel	Grad students introduced their experience with grad school and then answered questions regarding life in grad school and the application process	15	7
6/12/21	UG Mini Conference	Grad students will facilitate breakout rooms and help with technical skills, specifically with abstracts and presentations, during the UG BMES	TBD	12

		Mini-Conference		
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Mentor-Mentee Matching

Assigning Date	Description	Undergraduate Sign-ups	Graduate Sign-ups
Fall 2020	General mentorship	10	9
Spring 2021	Mentorship specifically geared towards preparing the UGs for graduate school and answering questions regarding that	9*	5*

*Spring 2021 sign-ups were in addition to ongoing mentorship relationships from the fall

Future Mentoring objectives:

Graduate BMES is working to strengthen our relationships with undergraduate mentees in the department by (1) holding more workshops to develop technical skills and (2) leading demos (such as SolidWorks) during class periods beginning in the Fall 2021 semester. In light of the move to remote activities, a primary goal of future events is to make them more accessible, such that both in-person and virtual attendance can be had. For example, many of the workshops will be developed and created over the summer, pulling together many of the skills and talents of our BMES members. They will be disseminated to both undergraduates and graduate students in the fall semester, as well as widely accessible via YouTube. As we have done throughout the last year, our co-chairs will continue to stay in contact with both the undergraduate BMES chapter as well as talk to faculty and TAs who interact with the undergraduates in order to seek new ideas for how to provide relevant and engaging mentorship activities. Our Mentorship co-chairs and are continuing to grow our program for BMES graduate members to provide mentorship to BME undergraduates or new graduate students to guide them in meeting their academic and career goals.

XI. Industry or Professional Development Activities

XIa. Abstract of Professional Development Activities

As of this past year, our BMES Chapter hosted its first industry career path Q&A panel, drawing our panelists from UD BME alumni. We have also started organizing the department's student seminar symposium, which is designed to promote the professional growth of our members through the simulation of a conference-level environment. We eagerly look forward to strengthening this sector of our chapter in the future.

XIb. Industry Activities

UD BME Industry Alum Panel

Following the spring Graduate Seminar Symposium, BMES hosted a panel discussion with three UD BME alumni to discuss their job application processes and the variety of industry careers.

Date	Goals	Description	Approximate Attendees
02/12/2021	Learn more about the path from PhD to industry; discuss various industry careers	Q&A panel of 3 UD BME alumni that now work in industry to better inform us of how to acquire post-graduate industry positions.	50

XIc. Professional Development Activities

Graduate Seminar Symposium

The Graduate Seminar Symposium is held twice a year for graduate students to present their research and practice conference-level etiquette. There are two types of talks: a 3-minute research pitch or a 12-minute research presentation. This event is a department requirement for students.

Symposium Date	Season	Description	Approximate Attendees
08/28/2020	Summer	This seminar included five 3-minute talks and four 12-minute talks detailing the research from 3rd and 5th year graduate students.	55
02/12/2021	Winter	A seminar that included four 3-minute talks and two 12-minute talks describing graduate students' research.	50

XII. Societal Impact Activities

As of June 1, 2021, our BMES Chapter has not hosted or attended an event or program designed to provide working medical solutions for members of our community. We look forward to working more extensively with our community partners to learn about their needs. We hope to implement new programs and partnerships in order to pursue these goals in the future.

XIII. National BMES Meeting

XIIIa. Summation of past experiences at the Annual Meeting

The University of Delaware Biomedical Engineering Department utilizes the BMES Annual Meeting as a great opportunity to recruit incoming graduate students to our BME graduate program. UD prides itself on being a tight-knit “family” of graduate students, professors, and faculty. The Annual Meeting has and continues to allow us to demonstrate to interested students how much of a family we are as we socialize around our Department Booth. Undergraduates and others interested in joining our program hear firsthand testimonials from our graduate students and BMES members about what they enjoy about UD’s BME program, their experiences navigating graduate school, and what type of research they are committed to advancing. Other than promoting our BME program, BMES members have enjoyed exchanging information with others about their research in poster sessions and oral presentations, with a strong past record of accepted abstracts, as well as learning about new research in various fields at the many talks held during the meeting’s duration. The BMES Annual

Meeting is a great opportunity for our hardworking BMES members to focus on strengthening their interpersonal skills and expanding their BME networks.

XIIIb. Expectations and goals for attending future Annual Meetings

The following expectations and goals have been provided by our current active BMES members:

- I plan on attending the Annual BMES Meeting to network and seek Post-Doctoral positions.
- Getting insightful thoughts on my ongoing projects and familiarizing myself with other work in relevant fields.
- Networking with others is my major goal when attending BMES Meetings in the future.
- I enjoy networking with new people I do not usually get to interact with, while also visiting the various college booths to see a snapshot of other college’s programs.

XIIIc. Chapter or members presented or awarded

Despite challenges posed by the COVID-19 pandemic, 20% of our members were still able to present a poster or talk at the 2020 Annual Meeting. The following chart details the attendants, their BMES National Member IDs, and their posters and/or oral presentations presented at the BMES Annual Meeting in 2020 held virtually.

Name of Attendant	BMES ID	Participation
Harrah Newman	2351769	Talk: Implementation of a Data-Driven Finite Element Model of Intervertebral Disc with Multigenerational Fibers to Establish Pre-Strain
Meghan Kupratis	4003805	Poster: Comparative Tribology: Articulation-Induced Cartilage Rehydration Across Species *Social Media Correspondent
Mackenzie Scully	4019219	Poster: Biomimetic Nanocarriers for ABT-737 Drug-Delivery to Triple-Negative Breast Cancer Poster: Cancer Cell Membrane-Wrapped Nanoparticles for siRNA Delivery to Triple-Negative Breast Cancer
Peyton Delgorio	2344270	Talk: Mechanical Properties of the Human Hippocampus: Sexual Dimorphism in Normal Aging
Megan Dang	4019963	Talk: Development of Antibody+siRNA Nanocarriers to Suppress Wnt Signaling in TNBC
Wade Stewart	2342008	Talk: Mechanically Tunable Substrates to Direct Cardiomyocyte Maturation and Cytoskeletal Remodeling

XIV. Future Directions

We have taken great pride in developing, organizing, and growing our chapter, its presence, and ultimate goals over the last several years. Now that we have established some baseline events that we can rely on every year for mentorship and outreach, we can reach further.

With the onset of the COVID-19 pandemic, we have been vigilant in keeping up our presence and continuing to foster community. Now that events have shifted from in-person to virtual and now again to potentially in-person, we are faced with new challenges and new opportunities. Here are several proposed ideas at varying levels of completeness and plans for action in our (near) future:

1) **Mentorship Events**

a) Professional Development Workshop Series

- i) *Description:* This series would cover the following:
 - (1) How to write a CV, personal statement, and cover letter
 - (2) Virtual and in-person networking skills
 - (3) Interview prep
- ii) *Timeline:* Developed through beginning of Fall 2021; Implemented early/mid Fall 2021.
- iii) *Requirements:*
 - (1) Interested Grad Students with relevant experience to develop curriculum and host workshops
 - (2) Virtual meeting space (Zoom or Gathertown)
- iv) *Contingency:* Depending on COVID restrictions, the program can be adjusted. At a minimum, the program can be a success if we host workshops virtually. We would like to be able to potentially hold workshops in person depending on COVID restrictions and student availability/willingness to attend workshops in person. If we were to hold workshops in person, it would be nice to have pizza or other snacks to encourage students to attend.

b) BMES Office Hours

- i) *Description:* "Office Hours" throughout the semester where undergraduate students can practice interviewing or presenting presentations and receive feedback from graduate students. Undergrad students would request time and we would match them with our pool of interested graduate students
- ii) *Timeline:* Developed through beginning of Fall 2021; Implemented early/mid Fall 2021 with options to repeat or extend in the Winter 2021/Spring 2022 semesters depending on interest.
- iii) *Requirements:*
 - (1) Interested Grad Students
 - (2) Virtual meeting space (Zoom)
- iv) *Contingency:* Depending on COVID restrictions, the program can be adjusted. At a minimum, the program can be a success if we hold office hours virtually. We would like to be able to potentially hold office hours in person depending on COVID restrictions and student availability/willingness to attend office hours in person.

2) Inter-Chapter Event

a) Description:

- i) Coordinate with local chapters at University of Pennsylvania and University of Maryland to supply letters of support and appreciation for local health care workers close to each institution. Additionally coordinate with local hospitals, nursing homes, etc. to provide fun and engaging materials to patients influenced by the current COVID pandemic. Care packages could include puzzles, sheets of fun facts, and “scavenger hunts” to STEM and BMES related research and fun videos and projects.
- ii) *Timeline:* Developed through June and July 2021; Implemented Summer/Fall 2021, with options to repeat or extend in the Winter 2021 depending on need.
- iii) *Requirements:*
 - (1) Funding - Materials for cards and writing implements. Materials for caretakers to provide fun activities for patients (i.e. puzzles, riddles, scavenger hunt of fun STEM and BMES facts, etc.).

3) Outreach Events

a) Learn about Vaccines with Girl Scout Troops

- i) *Description:* Organize an outreach activity to educate Girl Scout Troops about the engineering behind vaccines in a fun hands on way. Currently there’s lots of talk about controversy with the new vaccines, but not much about the science behind it. Through this module we could help educate the Girl Scouts on the importance of vaccines and how they work and are made.
- ii) *Timeline:* Event held over Summer 2021, can be done at multiple times during the year and next depending on funds.
- iii) *Requirements:*
 - (1) Facility to hold the event depending on current COVID restrictions. Potentially an outside venue if weather permits. Could be moved to a virtual platform too for more flexibility.
 - (2) Marketing campaign to demonstrate our dedication to outreach in the community, with hopes that word of mouth and other social media advertising will boost our presence in the community.
 - (3) Funding and materials for activities including building your own model virus and glitter for demonstrating how easily viruses spread.

b) University of Delaware Student Engineering Program (UDSTEP)

- i) *Describe:* University Student Taught Engineering Program (UDSTEP) is a fun-filled, educational outreach program for middle and high school students that started at the University of Virginia. Our BMES chapter will host a similar event in the fall. UDSTEP allows middle and high schoolers to have a one of a kind experience taking classes taught by passionate UD BME and COE students.

Students will be able to take 3 classes during a one-day event they find interesting from a class catalog. Potential topics include forensics, programming, rockets, and more. The ultimate goal of this event is for students to be inspired by college students and get excited about learning new things, in a fun and stress-free environment.

- ii) *Timeline:* Summer - Start reaching out to local middle and high schools in the Newark area. Reach out to UD BMES chapter other COE organizations to recruit teachers. Fall - Finalize course catalogs and start developing classes. Create registration for the event. October/November - Finalize registration and courses and hold event.
- iii) *Requirements:*
 - (1) Lecture halls for classes depending on current COVID restrictions. Potentially an outside venue if weather permits. Could be moved to a virtual platform such as Zoom for more flexibility.
 - (2) Volunteers for the day of the event to help answer questions and guide students to classes and to help out teachers
 - (3) Funds for course materials
 - (4) Food for the students and teachers

Overall, our chapter is in a very good position to continue our mission of fostering outreach and mentorship in our BMES community, the greater BME community, and the communities in which we live and work in. The additional CDR funding will provide us with some much needed resources to enhance our mission and be able to achieve more visible events in the greater community.

The University of Delaware Chapter would like to again acknowledge and thank the Student Award Committee Members for their time and dedication to BMES and it's chapters. We also would like to thank them for their time to review our application. We hope that we have convinced you of our tremendous growth over the last few years and our hope and promise to continue to provide engaging and educational programs within our chapter, across BMES chapters, and with the greater Delaware community to support BMES and its mission.