

## **Chapter Development Report**

The University of Texas at San Antonio BMES Student Chapter

May 2018 – May 2019

Angela San Juan

Chapter President

832-621-8224

[bmes.uthscsa.utsa@gmail.com](mailto:bmes.uthscsa.utsa@gmail.com)

### **Executive Summary**

The Biomedical Engineering Society at UTSA is proud to present our chapter's work and efforts during the 2018-2019 academic school year. Our chapter's continued pursuit for growth by continually expanding our membership, connecting with surrounding BME companies, building a bridge between the students in the department, and most of all by providing opportunities for our members to contribute to the community paves the way for the next generation of biomedical engineers at UTSA. Our chapter was led by hardworking student officers and experienced faculty advisors this past year. This report illustrates the accomplishments of both the officers and our wonderful faculty advisors.

To Whom It May Concern,

For the school year of 2018-2019, the Biomedical Engineering Society at the University of Texas at San Antonio has had one goal in mind: to promote growth not only for the students in the organization, for other students in the program, and the BME Department at UTSA. Through fostering a strong student connection and relationship, cultivating an inclusive environment for continued pursuit for growth in areas of professionalism, leadership, and technical development, BMES at UTSA has managed to successfully engaged students in BMES activities, industry/ research positions, and the BMES National Conference like never before. This unprecedented growth in our chapter was performed to paved the way for the next generation of biomedical engineers coming at UTSA.

In regards to growth, our membership base each year has continued to increase as well as attendance at BMES events. During the summer before the academic year, our officer board has reconstructed our constitution and bylaws to allow better operations and flow for the upcoming year. Our chapter now consists of 5 executive board members and a total of 11 board of director members. Lastly, acquiring around 87 chapter members for the entire school year. By reconstructing our constitution, we have expanded our chapter participation/administration on events such as the 2018 BMES Annual Meeting, Annual Biomedical Research Symposium and lastly hosting our first intercollegiate Medical Device Make-a-thon. We also launched our mentorship program during the spring of the academic year and provided technical workshops to bridge the gaps within our education and provide an introduction to materials taught by the department.

Within this expansion, we were able to fund 21 students to attend the 2018 BMES Annual Meeting. Through our summer engineering camp and departmental support, we were able to offer funding for lodging and travel expenses allowing over 12 students to present their research. These students were able to successfully network with other biomedical engineers from other universities as well as faculty. Among those students who attended, this experience paved the way for them to attend prestigious internships this summer as well as admission to graduate programs. At UTSA, we held an event similar to a Hack-a-Thon, the Medical Device Make-a-Thon is a competition wherein participants have 48 hours to design and prototype a medical device that solved a given clinical problem. During our first year hosting the event, 65 students with majors ranging from biology to electrical engineering were split into 13 teams representing 5 universities. Not only was this the first intercollegiate biomedical design competition in the region, but competing teams also produced 10 viable future treatment options for the assigned disease state. Events like those described about have done a lot for growing the UTSA BMES chapter and we will continue to hold new events turn that promote our core principles and goals, as well as the core objectives of the bmes national chapter.

Sincerely,

Angela San Juan

Mikayla Rahman

Ben Johnson

Student Chapter President

Student Chapter VP- External

Student Chapter Treasurer

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## **I. Administrative Report**

During the summer before the 2018-2019 academic year, UTSA BMES experienced a major structural remodeling in terms of the organization's constitution and bylaws which lead to our current officer hierarchy. To establish an efficient and high functioning officer board, two levels of hierarchy was established. The two levels of the hierarchy consist of the following: the Executive Committee and the Board of Directors. The Executive Committee consists of 5 executive officers elected by the general membership who oversees, plans and leads events in the organization as a whole. While the board of directors consists of 11 officer board and the three faculty sponsors which are all elected by the general membership. Each position in the official board is either in charge of internal/external affairs of the organization, whether it would be contacting corporate sponsors (external affairs), organizing large scale events in the University (internal affairs), or providing professional development opportunities (external/internal affairs).

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### **IA. Executive Committee Positions**

#### **President, Chief Executive Officer (2351277)**

*Angela San Juan ([vzx281@my.utsa.edu](mailto:vzx281@my.utsa.edu))*

As the chief executive officer of the organization, in charge of alerting all members, board of directors, and committee members of their respective meeting by the appropriate deadlines, overseeing all operations within the organization

#### **Vice President External, Chief Operations Officer (4011299)**

*Mikayla Rahman ([hgk976@my.utsa.edu](mailto:hgk976@my.utsa.edu))*

As the chief operations officer, it shall be his/her duty to oversee all projects and programs involving non-UTSA entities including Industry Tours, Alumni/Industry Networking events, Annual BMES Meeting, High School Outreach and student design competitions.

#### **Vice President Internal, Chief Business Officer (4011477)**

*Ross Cowart ([ufd229@my.utsa.edu](mailto:ufd229@my.utsa.edu))*

As chief business officer, it shall be his/her duty to oversee all projects and programs concerning recruitment, membership engagement, faculty-student interaction, graduate student relations and fundraising.

#### **Secretary, Chief Administration Officer (4011307)**

*Valeria Juarez ([upm901@my.utsa.edu](mailto:upm901@my.utsa.edu))*

As the chief communications officer of the organization, it shall be his/her duty to keep and maintain updated all records of the society, announce scheduled meeting to appropriate membership, notify members of deadlines

#### **Treasurer, Chief Financial Officer (4011500)**

*Ben Johnson ([jvh657@my.utsa.edu](mailto:jvh657@my.utsa.edu))*

As the chief financial officer, it shall be his/her duty to keep all financial records of the Society and for making them available for annual auditing, serve as a member of the Executive Committee

## IB. Membership

<u>Academic Year</u>	<u>Chapter Members</u>	<u>National Members</u>	<u>Fraction of Students in Chapter</u>
2016-2017	59	--	--
2017-2018	73	10	14%
2018-2019	87	22	25%

Graduate students are welcomed to join the organization. However, they have their own student organization, The Biomedical Engineering Graduate Student Association (BMEGS-SA)

## IC. Executive and General Body Meetings

<u>Date</u>	<u>Attendance</u>	<u>Fraction of Membership</u>	<u>Meeting Type</u>
May 2018-Aug. 2018, Weekly	8	9%	Board of Directors Meeting
Aug. 2018 - May 2019, Biweekly	6	10%	Executive Board Meeting
Aug. 2018 - May 2019, Biweekly	11	22%	Board of Directors Meeting
Sept. 6th, 2018	63	70%	General Membership Meeting
Oct. 4th, 2018	49	55%	General Membership Meeting
Nov. 1st, 2018	53	60%	General Membership Meeting
Feb. 2019 - May 2019, Weekly	5	6%	Internal Committee Meeting
Jan. 30th, 2019	34	39%	General Membership Meeting
Feb. 18th, 2019	25	29%	General Membership Meeting
March 19th, 2019	23	26%	General Membership Meeting

## ID. Sample of Board of Directors Meeting Notes

	Agenda
I.	Internal Committee
A.	Ice Cream & Board Game Social <u>Date/Time: Thursday, September 13th at 5:30 PM BSE - MULTIPURPOSE ROOM</u>
	1. Reserve Room - Ross Covart
	2. Advertisement: Sukhi
	3. Officer Attending: Valeria, Melissa, Mikayla and Ross Covart
	4. Ice Cream Scoop - HEB Curbside
	5. Setting up the poll and advertisement for the event
B.	Monster Mash Pumpkin Smash - Ross Covart
	1. Progress Report
	2. Design Team Updates
	3. Build Day Updates
	4. <u>Deadline for MMIPs: September 15th</u>
C.	Internship Preparation Workshop <u>Date/Time: Tuesday, September 25th at 11:30 AM - 1:00 PM</u>
	1. Panelist of UG Research:
	a) Pete Guelder -> Texas A&M Summer Program
	b) Sukhwinder Kaur -> Leadership Alliance
	c) David Hall -> MIT MSRP Summer Program
	d) Melissa Cadena -> Navy Summer Research Program
	e) Cynthia Perez -> Northwestern University Summer Program
	2. Speaker -> Group Panel
D.	Mentorship Program
	1. Roundtable, mixers, application
	a) Sukhwinder Kaur
	2. Updates
E.	Newsletter
	1. Email students from the regular gmail account as well as mailchimp
F.	Decals and Shirt Update
G.	Reach out to Top Scholars and Honors College
II.	External Committee
A.	Industry Tour Update - Edgar Cantu
	1. List of Biotech and Medical Device Company
B.	Speaker for the next meeting
III.	Treasurer
A.	Financial Solicitation Report - Due September 24th - Rowdylink
B.	External Sponsorship request - DUE SEPT 1st!
C.	budget line proposal - David Hall - Website
D.	Supplies in Guda's lab
	<u>To Do List:</u>
	1. For the UROPE Program, find Ph.D.'s willing to talk about opening in their research lab
	a. Event is scheduled for October 4th at 6PM. After the general meeting.
	Everyone next week tuesday at 5:30 PM! Supplies in Guda's lab
	2. Frequent notification in the BMES GroupM4

IV.	Treasurer
A.	BMES T-shirts/ Decals
B.	Design - Angela
C.	Financial Solicitation Report - Due September 24th - Rowdylink
D.	External Sponsorship request - DUE SEPT 1st!
E.	budget line proposal - David Hall - Website
F.	Supplies in Guda's lab
	<u>To Do List:</u>
	1. Ross - Reserve Room for Ice Cream Social/Internship Prep Workshop
	a. Advertise MMIPs through email, send an interest survey for people that are interested in joining the team
	b. <u>Application for MMIPs DUE September 15th!</u>
	c. BMES T-shirt Designs
	d. Email Dr. Appleford if he is able for the internship workshop date and time
	2. <u>Subli:</u> - Make flyers for ice cream social, internship Prep Workshop, Monster Mash Pumpkin Smash
	a. Be the representative that communicates event in the groupchat
	3. Melissa
	a. Reserve/ talk to Jasmine about the org room for BOD Meetings
	b. Biweekly BOD Meeting date:
	1. September 11th and 25th
	2. October 9th and 23rd
	3. November 6th and 20th
	b. Collaborations for the FE Workshop
	4. Mikayla
	a. Student Design Competition
	b. Conference final forms needed
	5. Ben
	a. Financial Solicitation Report - Due September 24th - Rowdylink
	b. External Sponsorship request - DUE SEPT 1st!
	c. Flight Booking
	6. Edgar
	a. Getting an industry tour date
	b. List of available internships/jobs from companies in the SA area
	7. David
	a. Website design
	8. Angela
	a. Email undergraduate about the student panel
	b. Itinerary for the workshop prep
	c. Email about the final conference details - confirming that they have sent the right information for flight booking.
	d. Email about the next general meeting to the general membership
	9. Franciaca
	a. For the UROPE Program, find Ph.D.'s willing to talk about opening in their research lab
	b. Event is scheduled for October 4th at 6PM. After the general meeting.
	Everyone next week tuesday at 5:30 PM! Supplies in Guda's lab

## II. Treasury Report

BMES at UTSA financial account was managed by our Treasurer. To fund our large scale events, we relied on our annual summer camp with the Interactive Technology Experience Center (iTEC). The summer STEM camps run for 3rd-8th grade students through iTEC has been our main source of funding for the past several years, including the 2018-19 academic year. We also received robust support from the Department of Biomedical Engineering at UTSA. The Chapters capital assets were kept in a total of five locations throughout the semester. These included the University-Provided cost center, our Frost Checking Account, Paypal Account, Venmo Account, and a cash-box.

### **IIA. Financial Summary**

#### Balance Summary

Beginning Balance:	\$9,603.72
Debits:	(13,438.63)
Credits:	16,473.24
Ending Balance:	\$12,638.33

#### Key Points:

- Membership for UTSA BMES was \$10
- Member T-shirts were sold for \$10
- Transportation and Lodging was paid for members going to the National BMES Conference

#### Excerpt from Fall 2018 General Journal

Date	Purpose	Account	Amount - \$	Breakout	Gross	Fee	Net
9/5/2018	Southwest Airlines Flight to BMES National Conference	Frost	(\$199.32)		\$0.00	\$0.00	(\$199.32)
9/5/2018	Southwest Airlines Flight to BMES National Conference	Frost	(\$199.32)		\$0.00	\$0.00	(\$199.32)
9/5/2018	Southwest Airlines Flight to BMES National Conference	Frost	(\$199.32)		\$0.00	\$0.00	(\$199.32)
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9/5/2018	Southwest Airlines Flight to BMES National Conference	Frost	(\$199.32)		\$0.00	\$0.00	(\$199.32)
9/5/2018	Southwest Airlines Flight to BMES National Conference	Frost	(\$199.32)		\$0.00	\$0.00	(\$199.32)
9/5/2018	Southwest Airlines Flight to BMES National Conference	Frost	(\$199.32)		\$0.00	\$0.00	(\$199.32)
9/6/2018	Papa John's (Pizza for First General Meeting)	Frost	(\$104.00)		\$0.00	\$0.00	(\$104.00)
9/9/2018	Raha Shanebandi	Paypal	\$19.68		\$20.58	(\$0.90)	\$19.68
9/13/2018	Natalie Coppala	Paypal	\$19.12		\$20.00	(\$0.88)	\$19.12
9/13/2018	Roxanne Cantu	Paypal	\$19.12		\$20.00	(\$0.88)	\$19.12
9/13/2018	Carlos Bedolla	Paypal	\$19.68		\$20.58	(\$0.90)	\$19.68
9/13/2018	Vangelina Osteguín	Paypal	\$19.68		\$20.58	(\$0.90)	\$19.68
9/14/2018	HEB - Ice Cream for IceCream/Boardgame Social	Frost	(\$48.05)		\$0.00	\$0.00	(\$48.05)
9/17/2018	Ben Johnson	Paypal	\$19.12		\$20.00	(\$0.88)	\$19.12

This General Journal was used to keep account of all cashflow out of, in to, or between accounts. The Treasurer was responsible for maintaining this General Journal and ensuring that spending

did not exceed budgeted amounts as well as to recommend adjusted budgeting to the board of directors based upon revenue collection throughout the year.

### **III. Chapter Activities**

#### **IIIA. Industry and Professional Development**

Our goal as an organization is to facilitate connections between our members and local industry. In order to accomplish this goal, this year we held more professional development workshops which covered topics like getting an internship and the GRE, promoting local industry through tours, and giving our members an increased understanding of important engineering programs like SolidWorks. This year we have held more of these events than in any year prior, giving our members unprecedented access to industry and academic internships.

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#### **Industry Tours**

Throughout the course of the 2018-2019 academic year, students were able to visit various Biomedical company facilities as a joint effort between BMES and the sponsoring company. Students who attended are given a tour of facilities, company background, and brief introductions to key people employed by the company. It was the intention of BMES-UTSA to have a company sponsored tour once a month during the Fall (SEP - NOV) and Spring (FEB - APR) Semesters for a total of six Industry Tours. The tours that occurred are as follows:

Company	Attendance	Date
<b>Seno Medical Instruments</b>	6	Sept. 27th, 2018
<b>Incube Labs</b>	5	Oct. 26th, 2018
<b>Southwest Research Institute (SWRI)</b>	11	Nov. 2nd, 2018
<b>StemBiosys</b>	7	Nov. 16th, 2018
<b>BioBridge Global</b>	5	Feb. 20th, 2019
<b>Rochal Industries, LLC</b>	8	Apr. 12th, 2019

The spots in these industry tours are limited by how many people the company can accommodate.

#### **Professional Development Workshops**

These workshops aim to increase the number of opportunities available to our members in regards to their development as professional engineers. We offered multiple workshops that were not offered in years prior in an effort to innovate within our chapter. Many of these activities were designed to fill in gaps within our education and provide an introduction to materials taught by the department. Other workshops, like our GRE/FE workshop explored areas not directly covered by the BME classes offered at UTSA, with the goal of preparing our members for these important tests.

Workshop	Attendance	Date
Internship Workshop Summer Research Programs	20	September 2018
GRE/FE Workshop	15	October 2018
SolidWorks Workshop Session I: <i>Introductory Course</i>	25	January 2019
SolidWorks Workshop Session II: <i>Design Challenges</i>	16	February 2019
SolidWorks Workshop Session III: <i>Prepping for the SolidWorks Certification Exam</i>	15	March 2019
SolidWorks Certification Exam	5	April 2019



### **Annual Biomedical Research Symposium - March 2019, 189 attendees**

In 2019 we decided to expand the scale and scope of the symposium drastically. In order to accomplish this, we reserved twice the amount of space and attempted to make our poster presentation area more interdisciplinary by inviting other engineering disciplines, STEM based student organizations and stem research programs to have their members present at the symposium. We also included tables and a setup area for our BME senior design teams inside the main area of the symposium. In addition to these changes, 3 guest speakers were invited, as well as over 20 industry professionals and companies. These changes culminated into the largest symposium ever held by BMES at UTSA. Future improvements will concern working hand in hand with the department to bring in more outside organizations and professors.

### **IIIB. Social Activities**

As an organization, we hope to create a comfortable and inclusive environment where all members feel welcome. Our VP internal and committee set up social events to encourage



members to socialize and interact with one another as well as promoting interactions between BME class cohorts. This year, we organized small and intimate events in order to increase one on one interaction between members and officers. Our beginning and end of the year socials are meant to allow the the organization to interact as a whole. BMES hosted conducted seasonal events such as the Halloween Social and Winter Social to allow the students to come together to destress from a stressful semester and enjoy the company of fellow BME students. The organization also participated in a college wide event such as the Monster Mash Pumpkin Smash where members volunteered to promote STEM by conducting fun experiments at our booth for K-12 students.

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**The Block Social - *September 2018, 25 attendees***

BMES at UTSA hosted a social event at The Block at the beginning of the semester to allow the members to begin building networks within the organization as well as reconnect with one another.

**Ice Cream Social - *September 2018, 40 attendees***

This social was scheduled a day after the first general meeting, it is meant to kickstart recruitment of new members. We hoped to promote student interaction among classes and connecting new freshman biomedical engineers together. Lastly, to give an opportunity to new members expand their network.

**Halloween Social - *October 2018, 17 attendees***

The BMES conducted a Halloween Social mid-semester, where students came together to destress from midterm exams and enjoy the company of fellow BME students. We played board games where the students got the chance to mingle and meet new students that they weren't familiar with.

**Holiday Social - *December 2018, 25 attendees***

The BMES hosted a winter themed social near the end of the semester so the membership could come and relax, destress, and spend time with their colleagues during. The holiday social was used to close out the semester with the members.

**Mentorship Speed Dating Social - *January 2019, 20 attendees***

This event was to introduce upper and lower classmen to teacher to establish mentor/mentee relationships within the department. Previous feedback from members indicates just how important these relationships can be in finding academic REU's and industry positions.

**Board Game Social -*February 2019, 16 attendees***

This was a fun event aimed at getting our members to interact with others in different years. Various board games and light refreshments were available to all attending members.

### **Bowling Night - March 2019, 10 attendees**

This was a mentorship program based outing to allow mentors and their mentees to socialize and build a better, formal relationship. The event was held at University Bowl, a location near UTSA.

### **IIIC. Inter-Chapter Activities**

One of BMES at UTSA's goal this year was to further focus on growth externally. After attending the Annual BMES Meeting and being given the opportunity to interact with other chapter's BMES representatives, our board has recognized the importance of collaborating with other BMES student chapters. Similar to a Hack-a-Thon, we successfully hosted our first Medical Make-a-Thon. It is a competition in which participants have 48 hours to design and prototype a medical device that solves a given clinical or medical problem. In 2019, at the inaugural SSW Regional Medical Device Design Competition, 65 students with majors from biology to electrical engineering in 13 teams representing 5 universities competed. Not only was this the first intercollegiate biomedical design competition in the region, but competing teams also produced 10 viable future treatment options for the assigned disease state.

### **Medical Device Make-a-thon**

The Make-a-Thon aims to provide engineering students with hands-on experience using CAD and the design process in preparation for their capstone senior design project. Students will have the opportunity to prototype their device using the CITE (Center for Innovation, Technology, and Entrepreneurship) Lab on campus, as well as resources from the College on Engineering Student Success Center. Utilizing 3D printing, laser cutting, and other prototyping techniques, the teams will work to turn their designs into a functional device to present to industry professionals from the rapidly expanding San Antonio Medical Community.

2019 Challenge:

Chronic Obstructive Pulmonary Disease (COPD) refers to a group of diseases that cause airflow blockage and breathing-related problems. It includes emphysema, chronic bronchitis, and in some cases, asthma. Many patients have more than one of these conditions concurrently.

- You have 23 hours:
  - Develop a novel treatment option for COPD in a specific patient population. For the 2019 competition, finalist teams will have access to 3D printers to generate a proof of concept demonstration or prototype.

Five universities, 13 teams, and 65 students competed to create new solutions for COPD. Their solutions ranged from a surgically implantable positive expiratory fan to a modified cannula for improved O2 delivery and patient comfort.

For more information about the SSW Medical Device Design competition, please visit [www.medical-make-a-thon.com](http://www.medical-make-a-thon.com).

Quotes from participants:

- “Thanks so much for organizing this amazing event! It was awesome to compete with teams from all around Texas and see the cool perspectives put into finding a COPD treatment.”
- “[the competition] challenged us and made us connect with our team on a personal and professional level”



### **IIID. Outreach Activities**

BMES at UTSA’s goal this year was to encourage students to pursue a STEM field careers in the future by providing them with fun stem related activities which encourage a sense of curiosity and critical thinking.

### **Interactive Technology Experience Center (iTEC) Summer Engineering Camp**

BMES at UTSA conducted 2 weeks of iTEC camps. One for children 3rd-5th grades and the other for 6th-8th grades. The curriculum for both weeks was 5 days long and consisted of 5 topics: Biomaterials, Biomechanics, Nanotechnology, Cellular Biology, and General Engineering Day.

For biomechanics day, students were asked to build devices for specific tasks and were supplied with general design concepts and household equipment to build them. For example, students were asked to design as device that could be used to transport toxic liquid from one container to another without directly manipulating either container, and were introduced to the idea of a archimedes screw. Next, students were asked to build a launching device to catapult

marshmallows as far as possible, but were given a finite starting capital, and were required to “purchase” their materials and make do with what they had. Lastly, students were challenged to build bridges only using popsicle sticks and elmer’s glue that could hold the maximum amount of weight possible each team was required to build 2 bridges, one of which was required to be a suspension bridge design where string, which was supplied was integral in retaining the structure. Students were scored by the mechanical advantage of the bridges they built, the weight that the bridge held was divided by the weight of the bridge for a final score. The highest score/mechanical advantage of the bridge was 24.

For nanotechnology day, students were given general materials to complete different activities and experiments related to nanotechnology. For example students utilized pool noodles to measure a meter, decimeter, centimeter, and millimeter. From this they played a game that would allow the students to build their understanding of different measurements. Afterwards they watched a short video that would further explain how small a nanometer is as this was a hard concept for the students to understand without a visual representation. From there the volunteers from BMES used Elmer’s Glue, liquid starch, and iron oxide powder to create magnetic silly putty. The volunteers would mix the materials and allow the students to watch as this process is very messy. Once the slime was created a very strong magnet was used to show the students the effects of the magnet on their silly putty. We also challenged the students to evaluate and determine how this silly putty related to nanotechnology. Next, the students were able to watch another video that showed microfluidic channels with liquid passing through. From this they were able to use premade jello molds in petri dishes to create their own “microfluidic channels.” Although these channels were much bigger than normal microfluidic channels, it allowed the students to learn the intricacies of creating something so small. The students were also able to utilize more premade jello samples and small lasers to learn about refractive index by pointing the laser through the jello and measuring the angle of refractance.

For cellular biology day, students were able to build and complete varying tasks that taught them about plant and animal cells by using household items. For example, students were used varying food items like frosting, marshmallows, nerds, etc. to create a three dimensional model of plant and animal cells. This allowed the students to learn the differences between plant and animal cells and the functionality of each of the cell components. Next, the students were able to get in groups and play a jeopardy trivia game about cells, their components, functionality, and the difference between plant and animal cells. For the 6th-8th graders, we were able to do DNA extractions from strawberries to show the students that DNA is within plants as well. By using strawberries, NaCl, water, and soap we were able to extract the DNA from the strawberries and visibly analyze it. By filling it within a test tube we were able to show the students the strands of DNA that were floating within the solution they created. Next, the students were able to learn about the human body and its different systems, which students then were able to apply into a team game.

During General Engineering Day, students learned about several different engineering disciplines including biomedical, electrical, aeronautical, and civil engineering. The students had the opportunity to build a model set of lungs from a water bottle and balloons to learn about the physical mechanics of the respiratory system as well as the concept of positive and negative pressures and their consequences. They learned about the concept of equilibrium and center of mass as well as the mechanical interactions of trusses in a structural system and apply the concepts in a creative and competitive manner to a building project using marshmallows skewers and tape. The students were able to test their creativity and understanding of force and impulse as they relate to time by creating a device that would protect an egg from a second story fall. Students had the opportunity to watch the launch and subsequent landing of the SpaceX Falcon Heavy and learn about the complexities of automated in-flight rocket controls as well as the software and hardware required to make those controls possible.

#### **IV. BMES Annual Meeting**

This past year our BMES chapter was able to fund 21 students to attend the Annual BMES Meeting in Atlanta, Georgia completely funded. Previously we were able to fund only 4 people to attend and we learned the importance and impact on undergraduate students by attending a national conference. As a chapter we decided to make it our goal to give more of our members the opportunity to attend the conference in Atlanta, Georgia.

Our Vice President-External took on most of the work with the assistance of our board of directors and faculty mentors. We started to prepare for funding people during the early summer of 2018. During this time we were able to figure out all the logistics that needed to be handled in order to fund and send these people to the conference. We first had to determine how many people we could afford to fund. Our Vice President External met with our Treasurer to determine how much funding we would be able to use from our BMES funds. Once a number was determined and voted on by the board of directors, this amount of money was set aside for funding students to attend.

We then had to determine the lodging and airline tickets. We had to use specific airlines that were predetermined by our university. We then determined the cheapest flight that would allow time for everyone to arrive and get back in time for classes. We also called the various airlines to see what types of group discounts we could receive to make the plane tickets more affordable. Once that was determined we looked for lodging. We looked at Airbnbs within the area and around what their prices were. Once the approximate airline and lodging prices were determined we determined that with BMES funds we could fund 10 people to attend the conference

We then had to determine how we would choose who received the funding to attend. We were able to come up with a point system that included who's presenting, if they have volunteered for BMES, if they have any other funding, what year they are, etc. Throughout this process as well, we consulted with and met with other professors within the Biomedical Engineering department, like the Associate Dean of Undergraduate Students. These questions and their point values were then voted on by the board of directors. Once the point system was made, we reached out to our members to see who was interested in attending and asked them to fill out our questionnaire. We provided a deadline for everyone who was interested and filled out the questionnaire. Once all submissions were in we were able to calculate the points for each person.

In the previous year the Biomedical Engineering Department had provided the funding for 4 students to attend the BMES Annual Meeting. Our board of directors then decided that we wanted to approach our department and ask for them to match our funding to allow more students to attend. Our President, Vice President External, and Treasurer met with our Chair of the BME department about BMES funding students to attend the conference. After showing our budget, how we plan to utilize our budget, and our point system the department decided to meet our funding that came from the BMES funds.

We first determined that with this extra funding we would be able to fund 20 students to attend the conference. We later found that due to over budgeting we could fund one more student making the total 21 students who would get to attend.

Once we knew how much funding we had we determined the highest amount of points we reached out to our top 21 students. We informed them that they had a chance of receiving funding to attend the conference, but we needed them to provide some information prior. We asked for general personal information that would be required for a flight, abstracts if they had submitted one, and confirmation that they would attend the conference if they had received funding.

Once we got all confirmations BMES was able to book the flights and Airbnbs for all 21 students that were attending. We were able to book all of this prior to the Fall 2018 semester starting and during the early bird time period for getting the conference tickets. This allowed for our BMES chapter to efficiently use our funding to fund the maximum amount of students to attend the conference.

Out of the 21 students, we were able to fund to attend this conference, 13 were able to present their undergraduate research at the conference. Additionally, we had several members attend and gain valuable connections through the BMES sponsored events including the minorities in BME luncheon as well as the social events that helped build up networking for our students.

Name	National Member ID
Vangelina Osteguín	4002284
Cynthia Annette Perez	4090321
Melanie Breann Foster	4010543
Elysa Lam Jui	4010545
Edgar Kristopher Cantu	4011606
Benjamin Glenmore Johnson	4011500
Angela Michelle San Juan	2351277
Austin Richard Schoppe	2348937
Mikayla Rahman	4011299
Valeria Montserrat Juarez	4011307
Mercedes Elaine Vidal	4010546
Melissa Cadena	4011476
Ross Marshal Cowart	4011477
Pete Howard Gueldner	4011989
David Cody Hall	2350191
Sukhwinder Kaur	4011619
Naomi Hassan Kahtan Alyafei	4012032
Gabriela Meritxell Martinez	4012039
Carlyn Marie Abbott	4004750
Gabriela Isabel Cervantes-Gonzales	4012046
Matthew Burgess	4002284
Vangelina Osteguín	4090321
Cynthia Annette Perez	4010543
Melanie Breann Foster	4010545
Elysa Lam Jui	4011606
Edgar Kristopher Cantu	4011500

Benjamin Glenmore Johnson	2351277
Angela Michelle San Juan	2348937
Austin Richard Schoppe	4011299
Mikayla Rahman	4011307
Valeria Montserrat Juarez	4010546

<b>Name</b>	<b>Abstract Name</b>
Carlyn Abbott	Digital Extenders Platform for Augmented Intubation
Naomi Alyafei	Visualizing Collagen Damage in Impacted Articular Cartilage Using Collagen Hybridizing Probe
Melissa Cadena	Visualizing Graphene with Fluorophores under Ultraviolet Light for Improved Surface Transfer
Valeria Juarez	Modulation of Neural Activity via On-Demand Magnetothermal Drug Release
Elysa Jui	Computational Prediction of Angiogenesis Through Hydroxyapatite Scaffolds
Vangelina Ostenguin	A Preliminary Study to Understand Clot Adhesion in Acute Ischemic Stroke
Cynthia Perez	Electro-Stimulatory Bioreactor for Cell Culture on Piezoelectric Scaffolds
Angela San Juan	Magnetically Responsive Non-Viral Carriers for Brain Tumor Gene Therapy
David Hall	Optimization of Topographical and Mechanical Properties of PEG-DA Based Hydrogels for Promoting Neuroregeneration
Ross Cowart	Analysis of Raman Scattering Patterns as a Tool for the Diagnostic of Bone Disease
Gabriela Martinez	Altered Mice ECM Structure in the Absence of Laminin Alpha 4
Matthew Burgess	Effect of Dysfunctional Skeletal Muscle Satellite Cells on Angiogenesis



Austin Schoppe

A Biodegradable, 3D-Printed Implantable for Minimally-Invasive Controlled Delivery



### **VIII. Future Directions**

The chapter would like to continue its success this year to the next by upholding its standards and delivering to the members. Increasing the amount of networking opportunities for members is one goal for next year. BMES at UTSA would also like to promote social events and fundraising opportunities to gain more involvement from its members. The chapter looks to increase interest in research and encourage student members to participate in research labs at the university and local companies. Another focus is to provide diverse professional development opportunities such as a Resume workshop, Internship/Personal Statement workshop, AutoCad workshop and Undergraduate/Graduate Student Panel, Entrepreneurship panels, medical school panels. Alongside these focuses, the student chapter would also like to establish a good alumni network by connecting with various students that has recently graduated over the years. Overall, the biomedical engineering society at UTSA would like to enhance the chapter's national reputation by being more involved with the surrounding student chapters through design competitions, joint programming.