Restructuring Our GBMES Executive Board!

President – Timothy Buirkle
Vice President – Sita Damaraju
Event Coordinator/Secretary – Aarthy Sagathevan
BioInspire Newsletter Editor – Colin Friend

Due to several fall semester graduations, the following Executive Board positions are now available:
- Treasurer/Public Relations Chair
- Technology Chair
- BioInspire Newsletter Committee Members

Email Tim Buirkle (trb8@njit.edu), including the desired position(s), a contact phone number, and a brief bio detailing your qualifications and reason for interest.

GBMES EVENTS*  SPRING 2012

1st GBMES MEETING
Friday, 2/17 11:30AM
Fenster Hall, 6th Floor Lounge

2nd GBMES MEETING
Friday, 2/24 11:30AM
Fenster Hall, 6th Floor Lounge

RESUME WORKSHOP
Wednesday, 3/22 3:00PM
Fenster Hall, Room 698

NJIT CAREER, CO-OP, & INTERNSHIP FAIR
Wednesday, 2/29 12:30-5:00PM

SEMINAR 1 – Industry Guest Lecture
March, TBA
Fenster Hall

BIG EAST CAREER FAIR
Friday, 3/29 10:00AM-3:00PM
Madison Square Garden

SEMINAR 2 – Alumni Guest Lecture
March, TBA
Fenster Hall

3rd GBMES MEETING
Friday, 3/23 11:30AM
Fenster Hall, 6th Floor Lounge

SPRING BREAK!!
Monday-Friday, 3/12-16

INDUSTRY VISIT
April, TBA

4th GBMES MEETING
Friday, 4/20
Fenster Hall, 6th Floor Lounge

LAST DAY OF CLASSES
Tuesday, 5/1

MD&M EAST
Tuesday-Thursday, 5/22-24
Pennsylvania Convention Center

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Inspiration for Students

Have you ever been waiting in line at an ice cream shop and couldn’t decide what flavor to get? You had a few in mind, perhaps, but really wanted to be sure you got the right one. As the line got shorter, you felt the agony of your impending decision. Which is the right course of action in such a situation? With the wide variety of paths and specialties within the field of biomedical engineering, one might face a similar uncertainty and decision anxiety. By sampling several disciplines of BME, like flavors of ice cream, you will be more likely to fall into a path which fits your needs. There is no better way to learn your own preferences than through firsthand experience.

This approach may not be for everybody. You may have a job or internship taking up all of your free time or you may be fortunate enough to already know what you want to do. Yet, there are many students who could benefit from some exposure to the many paths within this field.

How do you get this exposure? Internships are probably the best in terms of resume-worthiness, but require more commitment than other routes. Another option is to participate in faculty research. Many faculty members will allow you to simply observe their laboratory meetings to see if the topic interests you. This outlet is particularly valuable to students on a thesis track.

Another great way to sample is to join clubs. Many of NJIT’s numerous club offerings pertain to BME in ways that are not immediately obvious. For example, I am currently in the robotics club, which helps bolster my mechanical skills. Also, I have joined the Association of Computing Machinery to advance my knowledge of programming and computers - areas which find constant use in all engineering disciplines.

Finally, one can look beyond NJIT and internships for experience. There are many independent clubs and groups that can provide a unique experience and look good on a resume. I frequent a community biotech lab in Brooklyn, which has equipped me with hands on knowledge of synthetic biology. One can find many such groups on the internet or at conventions.

For a field that spans biology, chemistry, and physics - one that embraces the mechanical, electrical, and medical disciplines - finding the right path can be daunting for a new student. Sampling things has helped me tremendously and I’m sure there are a few other BME students who could benefit. The best way to find out what you like is to simply try new things.
We questioned 3 students working in the BME Department about their experiences...here are their stories!

Gloria Portocarrero – PhD Candidate

Gloria has nurtured a passion for math and science since an early age. Taking advanced placement science courses in high school furthers her interest, and helped her to determine her favorite topics, chemistry and biology. NJIT’s biomedical engineering program offered an opportunity for Gloria to combine her scientific interests into one, multidisciplinary field. Upon completion of her undergraduate in 2008, Gloria opted to continue education as a master’s student, declaring her PhD candidacy one year later in 2009.

Gloria to combine math and science in a way which benefits medicine while fueling her own need to learn and grow. Gloria has found a venue for her research skills in the area of tissue regeneration, specifically cartilage. Her work involves the fabrication of novel cellular scaffolds for the differentiation of mesenchymal stem cells, potentially into functional cartilage.

Gloria suggests you focus on core concepts, rather than getting wrapped up in grades and simply obtaining a degree

When asked if she had any advice for newer BME students, Gloria recommended classes like Bio-statistics and Laboratory Animal Science, as they teach concepts and methods which are universal across many research fields. Become an active player in your own education; ask questions, work hard, and take initiative. Talk to professors about their field of research, define your own interests. The more involved in the program you become the more passionate and natural the work will seem. Your work will become part of you, and though still difficult, you will welcome the challenge research presents.

Featured Alumnus

Pankaj Marwah, J&J Scientist

Pankaj Marwah is a May 2011 NJIT alumni. His thesis concentration was centered around tissue engineering, primarily within the field of bone regeneration. His work led to the fabrication of an extracellular matrix scaffold suitable for bone cell growth.

Soon after graduation, Pankaj accepted a job as a project engineer at Johnson & Johnson. After applying, He received a call to come in for an on-site interview. The interviewer was most concerned with past lab and research experience, the hands on aspect of education. After four rounds of interviews, Pankaj was offered the position.

“Everyone should go for a thesis or project in order to gain research oriented experience. This will make you different from others and it will be easier to obtain a desirable job in the field. Rely on your faith, hard work, and personal confidence, as these are the most important factors in determining success.”

Pankaj believes his chemical and biological research experience combined with the multidisciplinary aspect of BME is what gave him an edge in the job market. Although his responsibilities at Johnson & Johnson differ greatly from his work at NJIT, Pankaj relies on the core concepts of biology, math, chemistry, electronic instrumentation, and computer science that he learned through NJIT’s Master’s program.

Past Semester’s FUN Event

Last Halloween, GBMES sponsored a trip to the Botanical Gardens in the Bronx, NY to attend the annual Bugs ‘N’ Brews event! At a point in the semester where piling work can become overwhelming at times, this trip allowed BME grad students the chance to relax and blow off some steam.

While there, GBMES members were able to tour Halloween-themed garden and displays, bravely sample some of the insect delicacies, and enjoy a variety of artisanal beers!
Dr. Mesut Sahin  
Associate Professor of BME

Since the commencement of the 2005 fall semester, Dr. Mesut Sahin has been a member of the NJIT community, currently acting as associate professor in the biomedical engineering department. Prior to NJIT, he received both his Masters and PhD from Case Western University; after which, he began working in the telecommunication industry in Istanbul for three years.

This spring semester, Dr. Sahin is teaching several bioinstrumentation courses, which look to incorporate a combination of both theory and hands-on experiments. From his top students, Dr. Mesut Sahin noted their innate ability to “question the engineering principles behind an observed phenomenon, in either experimental or theoretical data, and be able to explain it based on the knowledge gained through the courses taken.”

Neural engineering has long been a research field of choice for Dr. Sahin. More specifically, his work investigates brain-computer interfaces and microstimulation of the spinal cord for treatment of disability.

Currently, he is conducting a funded project called FLAMES (floating light activated micro-electrical stimulators). FLAMES is a semiconductor device, which is implanted into the spinal cord. Once activated, the device can then be remotely controlled by a low power near-infrared laser. Dr. Sahin and his colleagues aim to help patients paralyzed by spinal injury to regain their vital functions.

“The more I become involved in research the more I realize how little we know about the central nervous system. The list of potential avenues for making a contribution in this field is endless…”

In the end, what truly motivates Dr. Sahin is the application of numerous engineering principles in order to understand complex human physiology. When asked about the implications of his work, he touted, “The more I become involved in research the more I realize how little we know about the central nervous system. The list of potential avenues for making a contribution in this field is endless…” With an active ambition to continually explore the unknown, it is no surprise that Dr. Mesut Sahin is recognized in the BME department as one of the more driven and knowledgeable faculty NJIT has to offer.

Jonathan Groth, PhD Candidate

Upon earning his bachelor’s degree at Louisiana Tech University, Jonathan Groth soon went on to obtain his masters at NJIT. As a portion of his thesis, John developed a novel way to record from the cerebellum using an electrocorticogram electrode. Now a PhD candidate at NJIT, Jonathan is furthering his work to determine when the cortex is communicating to the cerebellum during movements and what type of information this signal may contain.

“Each problem and change in direction will open up possibilities that you would never have imagined.”

Since Jon was young, he was always interested in science and how things worked. Originally, he had planned to go into mechanical or electrical engineering; however, his interested in how the body worked made biomedical engineering a perfect fit for his interests.

When asked of his most interesting and rewarding experiences as a graduate student, Jonathan remarked, “Presenting your research at a conference. There, you’re surrounded by people in your field doing similar research as you…. [And are able to] get immediate feedback from many different people. I always come back learning so much from these conferences and finding new directions that I can take my research that I had not thought of before!”

Jon hopes to build upon these conference experiences as he finishes out his PhD, working closer towards his postdoc. Eventually, Jonathan plans to enter the academic arena, where he can focus on both his love for teaching as well as investigative research. To the other MS and PhD students heavily invested in research Jon’s advice is, “Get comfortable with your projects not going the way you expected them to go. There will always be problems and complications…. [but] you will learn more from these problems than from any class!”

Dr. Max Roman, GBMES Faculty Advisor

Dr. Roman is most likely the first professor you will meet in the Biomedical Engineering Department when you arrive at NJIT. He has been the BME M.S. Program Director and Advisor since arriving in 2006. During this time, he has seen the M.S. enrollment more than double to nearly 150 students. Dr. Roman is proud to say that the variety, breadth, and quality of courses now offered has helped make the graduate program at NJIT one of the premier biomedical engineering programs in the country.

As director of the MS program, Dr. Roman is involved in every phase of your enrollment as a student. Admissions, advising, graduation certification, course scheduling, and even job referencing when you graduate keeps Dr. Roman very busy and always in high demand. In addition, you will find Dr. Roman teaching classes, active in research, and serving as the GBMES club advisor. When asked about being so busy, he says, “I am very proud to have a hand and a direct influence on the lives and careers of each and every student who has gone through our program…That is very rewarding.”
5 Things you need to do to ensure receiving a job offer:

1. Know Your Career Development Services (CDS) Advisor: Alexia Jones - 973.596.2939, jonesa@njit.edu
2. Apply for On-Campus Recruitment (OCR)
3. Network, network, network!! Don’t limit yourself to only fellow BME students – anyone can potentially offer a useful connection to help get your foot in the door!
4. Know the CDS Website: http://www.njit.edu/cds/
5. Join GBMES! Whether it’s as a member or serving on the executive board, this club provides many opportunities to meet with those working in the biotech arena.

Sita M. Damaraju, PhD Candidate

Sita Damaraju is currently in her 3rd year at NJIT as a PhD biomedical engineering candidate. Her current work – under her advisor Dr. Treena Arinzeh – investigates the bone regenerative applications with various piezoelectric materials seeded with mesenchymal stem cells. With a PhD under her belt, Sita aims to progress into the industry field for regenerative medicine, eventually utilizing her varied experiences to settle into regulatory affairs for medical devices.

“BME is a unique major where I am getting exposed not only to the basic fundamentals of engineering but also to life sciences and computer science.”

In the case of most students, changing major tracks is not considered an uncommon outcome; however, biomedical engineering has always been a firm preference for Sita who attained her bachelor’s degree in biological engineering at the University of Georgia. For her, the choice of major is an obvious one, citing, “BME is a unique major where I am getting exposed not only to the basic fundamentals of engineering but also to life sciences and computer science. In addition, BME trains you to evaluate a given problem from multiple dimensions rather than one-directional.”

Sita continued to diversify her PhD experience at NJIT by seeking out courses offered at the University of Medicine and Dentistry of New Jersey (UMDNJ) as well. When asked about the more enjoyable or necessary courses taken, she noted “Core [UMDNJ] and Biomaterials [NJIT]. Core offered a fundamental understanding of biological systems, which biomedical engineers have to consider when developing or studying a biomedical device. Biomaterials, on the other hand, offered a wealth of information on materials and its properties, which is essential so that we can design better materials with appropriate function and interaction within a biological system.”

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Dr. George Collins, Research Professor

“I don’t know if “choose” is the correct term to describe how I became associated with biomedical engineering.” Says Dr. George Collins when asked how he got started in the field. As a leader in industrial polymer research for three decades, Dr. Collins relied on his materials science background to assist in innovation. When offered a position as Senior Scientist at the Medical Device Concept Laboratory of NJIT, Dr. Collins saw a chance to further his understanding into the realm of biological systems. Although Dr. Collins now teaches two biomaterials courses at NJIT, he remains as much a student as a professor. His open demeanor invites classroom discussion and his relevant anecdotes keep the class interesting.

“I am happy to be here!!”

Dr. Collins also continues to teach and learn outside the classroom. As a research advisor to master’s and PhD students, he attempts to show new researchers the excitement of laboratory study while guiding them through the trials that lie therein. Dr. Collins believes that the best student is not always the best researcher, and that there are three main attributes which make a researcher successful: passion, intellectual fortitude, and a tolerance for ambiguities.

Research can be a daunting task in which we are faced with our own ignorance and insecurities, but a good researcher can see beyond themselves and put personal misgivings aside for the pursuit of knowledge.

Dr. Collins is currently involved in several research projects. He and his students are developing an apparatus to electrospin Kevlar, quantifying charge behavior in electrospun materials, and developing an extracellular matrix to serve as a scaffold for cartilage regeneration. Dr. Collins is able to incorporate ideas from his research into classroom topics, and also take discussion ideas from class back to the lab.

He hopes in the coming years to gain a more profound understanding of the electrospinning process, and to develop a biomaterial capable of promoting cartilage regeneration. He would also like to see the creation of a research discussion forum for NJIT students and faculty, in which ideas could be presented for review and fresh perspective.

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