In the spring issue of BE Connected, I would like to highlight the successes of our BE students and faculty. Bioengineering at UoFL continues to be at the forefront of biomedical research. Our department generated the highest amount of research funding and peer-reviewed journal publications in Speed School. Bioengineering students and faculty have received local and national recognition, and won a number of awards. Twenty-one students won awards for research and other achievements. BE faculty were recognized with awards for their outstanding research and two faculty members received prestigious grants from the National Institutes of Health. Our student Biomedical Engineering Society (BMES) chapter is active and our alumni continue to make a significant impact in patients’ lives.

BE and Speed School continue to collaborate with international universities to strengthen UoFL’s global presence in education and research. These efforts have led to students from Egypt enrolling in our 2+2 undergraduate program and we are happy to be hosting eleven cooperative students from Egypt during the summer. These Bioengineering program successes might not have been possible without the support of our alumni, donors, able faculty and students. We are very grateful for the support of our donors, and we look forward to your continued support to help us achieve our target of raising $200,000. Your donations have already made a difference and have led to ten student awards so far this year. With your support, we hope to increase the number of student awards. We would love to hear from you. Please email us to send your updates and enjoy a happy and healthy summer!

Zachary Fowler Selected in Cardinal Founder Program

Bioengineering graduated MEng student Zachary Fowler has been selected as 1 of 6 UoFL researchers to take part in the UoFL/Humana Foundation Health and Equity Innovation Hub’s Cardinal Founder Program. The program’s aim is to find ways to close health equity gaps with the socially underrepresented communities by applying cutting-edge, interdisciplinary and applied community-engaged research to problems that plague such areas. Identifying and engaging in opportunities to advance health equity research into actionable activities are among the ways of achieving this much needed task.

Elizabeth Roy Accepted For Engineering Internship

Elizabeth (Libby) Roy, a UoFL Bioengineering student, has been accepted into the Master’s Program and the Clinical Engineering Internship at the University of Connecticut. The two year internship offers an in-depth and rigorous clinical experience that matches the engineering expertise gained in the classroom. The primary objectives are to provide exposure to hospital organization and administrative functions, an opportunity to apply engineering techniques to patient care and to provide substantial experience working with hospital personnel, nurses, technicians and medical staff. Currently seventeen hospitals in various locations around the country are participating in the program. Congratulations to Libby for this prestigious designation!

Balaha Named Outstanding International Student

Hossam Magdy Balaha has won the Outstanding International Student Award. This award is given to recognize international students who have made significant contributions to the advancement of the University of Louisville and represents the highest in academic achievement. Hossam is currently a Ph.D. candidate in the Department of Bioengineering and we are very proud and wish him the very best in his future endeavors. He is currently involved in a histopathology and radiology research project utilizing artificial intelligence to diagnose and provide treatment plans. He is also a Graduate Teaching Assistant for classes such as BE544, Artificial Intelligence Techniques in Digital Pathology.
Interview w/ a Student

Samuel Ibrahim Awad
We asked one of our students, Samuel Awad, about his experiences as an AlAlamein International University, 2+2 Program Bioengineering student at UofL. Mr. Awad has been enrolled in our program since 2022, finishing his last two years at UofL, in order to earn a B.S. in Bioengineering.

1. What prompted you to choose the AIU/UofL 2+2 Bioengineering degree program?
I chose the AIU/UofL 2+2 Bioengineering degree program because of its unique opportunity to gain a quality education from two reputable institutions in different parts of the world, providing a diverse and enriching academic experience, at a lower cost.

2. Overall, how do you feel about the program?
Overall, I am enthusiastic about the program. It has offered me a comprehensive curriculum, supportive faculty, and valuable hands-on experiences that have prepared me for the field of bioengineering.

3. How has the program improved your knowledge and opportunities?
The program has significantly improved my knowledge in bioengineering through rigorous coursework, practical laboratory sessions, and exposure to cutting-edge research. It has also expanded my opportunities by providing networking connections, internships, and access to resources from both universities.

4. What advice can you impart to potential applicants of the AIU/UofL 2+2 program?
My advice to potential applicants of the AIU/UofL 2+2 program would be to embrace the cultural and educational differences between the two institutions and countries, actively engage in both academic and extracurricular activities, seek mentorship from faculty members, and take advantage of all available resources to maximize their learning experience.

5. How might the program be improved?
While the program has many strengths, there is always room for improvement. One suggestion could be to further enhance communication and coordination between the two universities to streamline the transfer process and ensure a seamless transition for future students.

6. What has this program helped you to achieve?
This program has helped me achieve a solid foundation in bioengineering principles, practical skills, and a global perspective, empowering me to pursue further studies or embark on a successful career in the field.
Dhruvinkumar “Dhru” Patel is a UofL Bioengineering Alumni who has been out in the “real world” since 2012. He also serves this department in an advisory capacity on our accreditation policies giving us a true former student’s perspective for which we are very grateful and indebted. What follows is Dhru’s experiences in his own words.

My college education from the University of Louisville, Bioengineering Department, has enhanced my professional experiences by exposing me to diverse set of classes and challenges, collaborative environment, and introducing me to the latest advancements in Bioengineering. This led to building a strong foundation in critical thinking and problem-solving skills necessary to complete complex challenges in an ever changing environment.

In 2012, I graduated from University of Louisville (UofL) with Masters of Engineering in Bioengineering (BE). During my tenure at UofL, the rigorous courses (including Biomaterials, FDA & Device Design, Statistics, Instrument Analysis, and Programming), projects (including Senior Design), internships, and research opportunities cumulated into multiple publications, a book chapter, patents, awards, and valuable skills that prepared me for my successful engineering career thus far in the Medical Device Industry.

As a student in BE, I gained valuable knowledge through course work and projects related to programming, biomaterials, medical device design and manufacturing, patient safety, and ISO standards (including, but not limited to, ISO 13845, ISO 14971, and ISO 10993), which shaped my future. Previously, I held a role as the Principle Engineer at a branch of Johnson and Johnson for an internship. During my stay with Johnson and Johnson, I developed an innovative solution to obtain insertion force during surgery for pelvic organ prolapse. This led to training surgeons and paved the way for other engineers to collect data during surgeries. Not only was I able to use my knowledge in programming, but understanding of various biomaterials, medical device design and manufacturing to obtain data for patient safety and failure mode and effects analysis (FMEA).

Next, my subsequent internships were with UofL. During these internships, I held the position of a research engineer where I contributed significantly on researches related to macular degeneration, photothermal cancer therapy, and producing tunable near infrared-absorbing gold. As a direct result, I was able to help produce multiple publications, a book chapter, and patents through working in a collaborative environment.

Upon graduation, I held the position of Quality Manager at a pre-pharmaceutical manufacturing company. Using the skills I learned with various research opportunities within the Bioengineering Department, I was able to develop and perform analytical procedures to evaluate elements critical to quality for product release.

Currently, I hold the position of a Quality Manager for a medical device manufacturing company located in Louisville, KY. This branch is responsible for manufacturing Class I and Class II medical devices. These devices include single-use and reusable bipolar and monopolar forceps, catheters, cords/cables, electrosurgical pens/pencils, electrodes, and other accessories for electrosurgery. I help manage the facility in accordance with the quality management system to provide end users with complaint medical devices and ensure patient safety. My knowledge of programming and ISO standards including, but not limited to, ISO 13845, ISO 14971, and ISO 10993 were put to great usage in order to

Congratulations to our student award winners!

Rolando “Chip” Cheng Jr. Memorial Scholarship Award, 
Carmen Hsieh
Research Internship Awards, 
Mostafa Abdelrahim, Mohamed Khudri
Lewis S. Streng Award 
Claire Crowley
Jerry & Pat Sturgeon Academic Excellence Award, 
Bryce Thompson
Mickey R. Wilhelm Achievement Award, 
Yu Han Lai
Judi Olsen Endowed Scholarship, 
LaMargaret Johnson
Biomedical Engineering Society (BMES) Chapter Award, 
Heinrich Dreyer
Best Graduate Student Peer-Reviewed Journal Papers, 
Johnathan George, Hossam Balaha, Israa Sharaby
APPKI Doctoral Student Exemplary Achievement Award, 
Keyonna McKinsey
Exemplary Research Scholarship Awards, 
Ahmed Alksas, Mohammed Elsharkawy, 
Ahmed Sharafeldeen, Hossam Balaha, 
Ahmed Aboudessouki, Mohamed Azam
Exemplary Doctoral Dissertation Award, 
Dylan Goodin
Departmental Alumni Award 
Alexandra Stuedli
Co-Op Of The Year Award 
Michael Mills

2024 BMES Officers & Conference

The UofL chapter of the Biomedical Engineering Society (BMES) has voted in their officers. They are Heinrich Dreyer (President,) Ashlyn Coganougher (Vice-President), Alex Haughtigan (Secretary,) Jeffrey Miller (Treasurer,) Austin Williams (SSSC Rep,) and Sabeen Nadeem (Social Media Director.) The annual presentations take place in the fall, this year on October 23-26 in Baltimore, MD. Our students will have the opportunity to attend and present their research at the conference.
validate diverse materials, processes, and equipment to manufacture various medical devices.

I consider myself lucky to give back to UofL Bioengineering Department as a member of the External Advisory Board to help guide and shape the Bioengineering program based on current industry changes. Additionally, as a guest lecturer for the FDA & Device Design class to provide students greater understandings of various ISO standards, importance of safety and efficacy on medical devices, and ensure patient safety. As a result of the diverse set of classes and challenges, collaborative environment, and introducing me to the latest advancements in Bioengineering, the UofL Bioengineering Department has provided me with great opportunities that has enhanced my career and led me to where I am today.

**Dr. El-Baz Discusses Autism At Phoenix School of Discovery**

Dr. Ayman El-Baz, chair of the Department of Bioengineering, gave an invited talk at Phoenix School of Discovery located in Louisville, Kentucky on April 23rd at 6:30 pm. This was part of an after-school event named “Autism is My Superpower.” The Phoenix School of Discovery is a JCPS alternative school serving students in 6th-12th grades. Half of the school’s students are with special needs and a large portion of those have been diagnosed with autism. Dr. El-Baz’s presentation focused on the personalized diagnosis of autism and how it could lead to an effective treatment plan for each individual with autism, resulting in helping them live a much happier life. During the talk, Dr. El-Baz interacted with students of various ages, parents and teachers.

**Dr. Friboes Discusses Autism At Phoenix School of Discovery**

Hermann Friboes has recieved an R01 award from NIH titled 3D-bioprinting of probiotic bacterial interference catheters for the prevention of catheter-associated urinary tract infections. This award is a collaborative effort between The University of Louisville and Washington University in St. Louis. Receiving an R01 award from NIH is highly prestigious, reflecting the dedication and innovative work of Dr. Friboes and his lab. This is Dr. Friboes’ third active R01 award as the principal investigator.

**Joseph Chen Secures NIH R15 Grant**

BE Assistant Professor Dr. Joseph Chen has won an NIH/NCI R15 grant entitled, The role of hyaluronic acid remodeling and mesenchymal transitions in glioblastoma. Funding date begins: 04/24-03/2027, $469,500 over 3 years. This proposal studies the mechanical changes in ways tumor tissue influence disease progression using bioengineering tools and molecular assays. Dr. Chen is confident that, “New insights on how tumor tissue changes in disease progression may identify new therapeutic targets for glioblastoma.”

**BE Faculty Selected as NAI Senior Member**

Thomas Roussel, Associate professor of Bioengineering, has been selected by the National Academy of Inventors (NAI) to join their 2024 Senior Members. NAI Senior Members are active faculty, scientists and administrators who have demonstrated remarkable innovation producing technologies that have brought, or aspire to bring, real impact on the welfare of society. They also have growing success in receiving patents, licensing and commercialization, while educating and mentoring the next generation of inventors. This honor has been bestowed on 4 professors at UofL.

Dr. Roussel focuses on microfabricated/COTS sensor technologies and custom instrumentation, all in support of the development of analytical techniques for environmental studies, orthopedic and rehabilitation platforms, as well as biomedical diagnostic applications.

**BE Professor Wins Distinguished Faculty Award**

Dr. Steven Koenig, Professor and Endowed Chair of Cardiac Implant Sciences is one of five faculty that have received the annual University of Louisville President’s Career Achievement for Outstanding Scholarship, Research and Creative Activity award. Congratulations to Steven for this outstanding achievement!

**BE Donations**

We have established a student endowment with a goal of raising $200,000 by 2025. Due to the generosity of our donors we have raised approximately $60,000 to date. This has enabled us to present ten BE student awards this year. Your continued support is vital to fulfilling the endowment objective of recognizing meritorious students. For more information about how your donations can help transform the BE Department, please contact allison.commings@louisville.edu or call (502)852-2379.