**Vanderbilt Undergraduate Research Opportunities**

The combination of our established BME department and the immediate proximity of the Vanderbilt University Medical Center provides a tremendous wealth of opportunities for student involvement in research. Undergraduate research can enhance an engineering student's education and experiences outside the classroom. The School of Engineering highly recommends students actively seek out opportunities in various areas of interest in order to gain valuable skills and knowledge in research fields.

Research-active faculty members often allow undergraduate students to work in their labs as student workers, technicians, or assistants. Each lab could have very different requirements regarding academic performance or pre-requisite knowledge. Knowledge, skills, and abilities may vary significantly across departments and laboratories. Requisite knowledge will also vary greatly by project, by lab, by professor, and by department. Most faculty members will expect you to produce a periodic document and/or make a presentation to present your hypotheses, results, and conclusions.

If you are interested in a research position in a VU BME lab:

1. Read about various research areas and projects (a list of example labs is included below, but this list is not exhaustive) to determine which topics you are most passionate about. You may also click [here](#) to search biomedical engineering faculty members and read about their research foci.

2. Once you have determined what topics or labs you are most interested in, contact the professor who runs the lab or their graduate students to see if there are any available undergraduate positions in their lab. Faculty members are usually interested in highly motivated students who actively seek employment.

3. If you have not heard back from a contact within a couple of weeks, you may send one follow up email. If there is no response after the follow up email, you may conclude that that particular lab does not have any undergraduate positions available at the time, and you may consider contacting other faculty members or graduate students.

Students may seek out research opportunities at any point in their undergraduate career beginning in the freshman year on a voluntary basis. However, this involvement can occur through elective courses only in their junior (generally spring) and senior year. Up to three credit hours (total) of Undergraduate Research, BME 3860/3861 (240A/B) may count as a BME elective; an additional three hours of BME 3860/3861 may be used as a Technical elective. Note that to receive BME credit, the research project must be a BME type research project.
List of BME Labs

- Duvall Advanced Therapeutics Laboratory
- Sung Combinatorial Biomaterials and Biointerface Laboratory
- Haselton Laboratory, Laboratories for Innovation in Global Health Technologies (LIGHT)
- Giorgio Laboratory
- Vanderbilt Institute of Nanoscale Science and Engineering (VINSE)
- Vanderbilt Institute of Integrative Biosystems Research and Education (VIIBRE)
- Baudenbacher Laboratory
- Merryman Mechanobiology Laboratory
- Vanderbilt Institute in Surgery and Engineering (VISE)
- Biomedical Modeling Laboratory (BML)
- Vanderbilt University Institute of Imaging Science (VUIIS)
- Byram Biomedical Elasticity and Acoustic Measurement (BEAM) Laboratory
- Biophotonics Center

Additionally, many BME students work in Vanderbilt University Medical Center Labs such as the following:

- Bader Lab
- Becker Lab
- Ferguson Lab
- Force Lab
- Freiberg (V-CREATE)
- Galindo Lab
- Gumina Lab
- Hatzopoulos Lab
- Hill Lab
- Hong Lab
- Major Lab
- Moslehi Lab
- Nam Lab
- Vickers Lab
- Knapik Lab
- Iverson Lab
- Kalams Lab

Getting involved in a Medical Center works similarly to BME labs as students should find research that they are interested in and contact the lab to see if positions are available. Information about various departments and centers associated with VUMC and VU can be found here.

Research Do’s and Don’ts

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<th>Do’s</th>
<th>Don’ts</th>
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<td>…contact professors working on research that you are genuinely interested in</td>
<td>…contact a professor researching biomaterials if you really just want to work in biophotonics</td>
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<td>…behave professionally by letting professors know if you are in contact with multiple labs</td>
<td>…email every single lab in the above lists simultaneously</td>
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<tr>
<td>…use research as an opportunity to enhance your education and experiences outside of the classroom and gain valuable skills and knowledge in research fields</td>
<td>…get involved with research purely to boost your resume</td>
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Summer Research Opportunities

Vanderbilt

Vanderbilt School of Engineering Summer Research Program
Each student in the program works for 10 weeks under the supervision of a School of Engineering faculty member. Students work side-by-side with faculty, graduate students and other undergraduates on a currently active research project while gaining first-hand experience in laboratory research.

DEADLINE- Application will be available in February and due in March

Vanderbilt Undergraduate Summer Research Program (VUSRP)
VUSRP is a summer research opportunity available to enrolled Vanderbilt undergraduate students designed to enhance joint student-faculty research efforts.

PROGRAM DATES- May 29, 2017 through August 4, 2017
DEADLINE- All materials must be submitted by 4 pm on February 17, 2017

The SyBBURE Searle Undergraduate Research Program
This program aims to provide undergraduate students with mentored experiences in advanced scientific investigation with some of the University's leading research and teaching faculty.

PROGRAM DATES- May 29, 2017 through August 4, 2017
DEADLINE- All applications should be submitted by February 24, 2017

National Science Foundation Research Experience for Undergraduate (REU) Sites
Many summer opportunities are available at NSF REU sites in many scientific disciplines at numerous institutions and organizations through the United States. Above is the link to the NSF REU website, and below are a few of the available REU opportunities.

Computation Sensing and Medical Robotics
The Johns Hopkins University
Students will contribute to specific research projects pursued by faculty and researchers at the Laboratory for Computation Sensing and Robotics (LCSR). Each student will be a part of a collegial research team, including a faculty project supervisor and a graduate student mentor, and will work on a challenging research project. Some students may contribute to research on medical image registration and fusion or image enhancement and segmentation. Other students will help to develop new robotic devices to help support surgeons in the operating room.

PROGRAM DATES- May 28, 2017 through August 5, 2017
DEADLINE- All application materials need to be received by February 17, 2017
**Engineering Biological Machines**  
*MIT, Georgia Tech, or University of Illinois-Urbana Champaign*  
The National Science Foundation (NSF) Center on Emergent Behaviors of Integrated Cellular Systems (EBICS) announces its "Engineering Biological Machines" Research Experience for Undergraduates (REU) program for summer 2017. The program will include 10 weeks of hands-on research at MIT, UIUC, or GT, attendance of EBICS Annual Retreat in Georgia to learn about cancer, and networking with REUs across GT, UIUC and MIT, as well as students and faculty across all 11 EBICS institutions.  

**PROGRAM DATES**  
- GT: May 21, 2017 through July 30, 2017  
- UIUC: May 28, 2017 through August 5, 2017  
- MIT: June 11, 2017 through August 19, 2017  

**DEADLINE** - All application components must be submitted by February 17, 2017

**Entrepreneurial REU**  
*University of Connecticut*  
The aim of this E-REU is to provide students with a truly integrated research and entrepreneurship training experience, giving them both depth in fundamental engineering research, as well as breadth in entrepreneurial skills. As part of this REU, you will take part in cutting edge research on commercializable ideas with UConn faculty, as well as participate in an entrepreneurship program developed by co-PI and UConn’s Entrepreneur-in-Residence, Dr. Hadi Bozorgmanesh.  

**PROGRAM DATES** - June 5, 2017 through August 11, 2017  
**DEADLINE** - All application materials must be received by March 15, 2017

**Imaging and Mechanics-based Projects on Accidental Cases of Trauma (IMPACT)**  
*Wake Forest University*  
The Biomedical Engineering Department at Wake Forest University will offer several summer research opportunities in 2017 focusing on Imaging and Mechanics-based Projects on Accidental Cases of Trauma (IMPACT). Students selected for this REU program will receive a stipend, meals, and on-campus housing.  

**PROGRAM DATES** - May 22, 2017 through August 5, 2017  
**DEADLINE** - Applications will be accepted on a rolling basis until positions are filled. To guarantee your application will considered, apply by February 9, 2017.

**Vanderbilt Institute for Nanoscale Science and Engineering (VINSE)**  
*Vanderbilt University*  
Participation in the program provides students with a true interdisciplinary research experience in an environment where physicists, chemists, biologists, and all engineers collaboratively solve problems and create new scientific understanding. Each student works directly with VINSE faculty members and their research groups and has access to the VINSE laboratories, which are shared facilities available to all authorized users.  

**PROGRAM DATES** - May 28, 2017 through August 4, 2017  
**DEADLINE** - All application materials are due on February 15, 2017.
Other Opportunities

Biomedical Engineering Summer Internship Program (BESIP)
The NIBIB sponsored Biomedical Engineering Summer Internship (BESIP) is for undergraduate biomedical engineering students who have completed their junior year of college. The internship will allow rising senior bioengineering students to participate in cutting-edge biomedical research projects under the mentorship of world-class scientists in NIH laboratories in Bethesda, MD.

PROGRAM DATES- June 5, 2017 through August 11, 2017
DEADLINE- Online application is due February 9, 2017 and reference letters are due February 12, 2017

Summer Undergraduate Research Experience (SURE)
The University of Mississippi Medical Center
The School of Graduate Studies in the Health Sciences has established an internship program for training undergraduate students in the biomedical sciences. The SURE students are placed in laboratories at the University of Mississippi Medical enter under the mentorship of a biomedical researcher. In addition to the laboratory experience, students attend seminars and discussions aimed at enhancing their understanding of the current status of biomedical research and the career opportunities available. Students may also participate in weekly journal clubs and seminars, as well as taking part in various social activities.

PROGRAM DATES- May 30, 2017 through August 4, 2017
DEADLINE- Applications must be received by February 15, 2017

Summer Undergraduate Research Fellowship program (SURF)
The National Institutes of Standards and Technology (NIST) offers the SURF program for students majoring in science, mathematics, and engineering. There are two NIST SURF programs, one program of ~20 students in Boulder, CO and one with ~120 students in Gaithersburg, MD. These are paid internships, available in the many different types of research laboratories at both NIST locations.

DEADLINE- NIST requires that applications be submitted by the student's university. If you wish to apply to either or both of these programs, you must submit application materials to Associate Dean Paschal (Cynthia.paschal@vanderbilt.edu) no later than 5:00 p.m. Central on Wednesday Feb. 8th, 2017. If you are applying to both programs, provide separate copies of items requested by both programs. All documents must be either in PDF format submitted to Associate Dean Paschal electronically (preferred) or in hard copy submitted to her in the VUSE Dean's Office (SC 5332).

Oak Ridge Associated Universities (ORAU) Summer Research Programs
ORAU oversees several summer undergraduate research programs at Oak Ridge National Laboratory and other national laboratories.