**Art and Design**

**Assistive Devices for People with Physical Disabilities**

*Position: Research Assistant*

*Job Description:* Assisting Associate Professor Ashley John Pigford with his creative research, you will be responsible for myriad tasks including: internet research, preparing and processing user research, graphic/website design and maintenance, social media strategy/management and (potentially) electronics, physical computing and fabrication assistance (if applicable). Undergraduate and graduate students from any major are encouraged to apply. The most important skills you will need for this position are a strong work ethic, organized nature, self-motivation and a desire to help other people.

More information about Professor Pigford's research: [https://youtu.be/RSQTWi6K0bA](https://youtu.be/RSQTWi6K0bA)

*Time commitment:* Approximately 5-10 hours per week, on average.

*To Apply:* Send an email with your full name, major, expected graduation year and a brief statement describing your interest and aptitude for this position to Professor Pigford at design@udel.edu

**Behavioral Health and Nutrition**

Dr. Kim’s laboratory is conducting research projects related to diet and disease prevention (e.g., cancers, obesity, and type 2 diabetes). Under Dr. Kim’s guidance, undergraduate researchers will be assisting a research project investigating preventive potential and underlying molecular mechanisms of apiaceous vegetables against a cigarette toxicant in genetically engineered mice. In addition, we are also conducting a research project to investigate how dietary fructose can compromise carcinogen metabolism using cell model and animal model. Depending upon their interest, student(s) will decide a project whichever they would like to embark.

The undergraduate researchers will be working with graduate students and/or post-doctoral researcher of our lab. Biochemistry/biology/nutritional biochemistry/toxicology background would be helpful. Previous lab experiences (such as cell culture, animal handling, gene and protein expression, analytical analyses) would be plus but not necessary. Interpersonal skills are necessary. Should be self-motivated and open to learn new techniques.

*Approximately 10-12 hrs required per week.* Contact Prof. Jae Kyeom Kim (jkkim@udel.edu) for more information.
Biomechanical Engineering

Cartilage Bioengineering Laboratory

Job Description: This would be a great opportunity for a student interested in bioengineering research and practices. The project investigates whether resveratrol, an antioxidant in red wine, can prevent the occurring of osteoarthritis. Student will work with Dr. Lu and graduate students on the fabrication of nanoparticles for the release of resveratrol in knee joints. The student will receive all relevant lab trainings. The student can learn the fabrication of particles, evaluation of release profiles, and testing using animal models.

Required Skills: Background and interest in bioengineering. We will provide all necessary training. Students interested in graduate school application are preferred.

Time commitment: Approximately 3-8 hours per week, depending on the student’s availability

Contact: X. Lucas Lu – xlu@udel.edu

Biomechanical Engineering

Biomechanical Engineering

Job Description: The Kiick laboratories design molecules, based largely on proteins in the tissues of mammals, for use in tissue engineering and drug delivery, with applications in treating cardiovascular disease, arthritis, and wounds. Remote work in these project areas is possible, in the form of literature searches and summaries, figure preparation, and data fitting. For in-person laboratory work, the student will receive all relevant lab training. Undergraduates would work with graduate students in the laboratory on a range of possible topics/methods, including solid-phase peptide synthesis, engineering bacteria to produce proteins, protein synthesis and characterization, measurement of drug delivery rates and fitting of data. The research assistant will be included as a member of the Kiick group, and would participate in weekly lab meetings via Zoom and will talk multiple times per week with the graduate student mentor.

Required Skills:

- Be in good academic standing (GPA of 3.0 or above)
- Some background and/or interest in biochemistry and bioengineering
- Diligent, organized, and attentive to details
• Good time-management skills
• Students interested in graduate school are preferred

Time commitment: Approximately 10-12 hours per week, depending on the student’s availability

Contact: Prof. Kristi Kiick via email (kiick@udel.edu)

COSTAL ECOLOGY

Lab: Coastal Ecology and Bio-geomorphology Group (CEBG)

Job description:
Salt marshes are important coastal ecosystems, which are under threat of accelerated sea level rise. Drowning of salt marsh initiated by the formation of shallow water bodies so-called ponds is a major issue. The undergraduate assistant will work in the CBEG to perform remote sensing analysis on measured existing (satellite and UAV) data sets of various salt marsh systems present across the US East Coast. This project does not require access to the lab and can be done remotely. The student will apply algorithms available in ESRI packages (e.g. ArcMap or ArcGIS pro) to extract shallow inundated ponds from salt marsh across Delaware. Pond extraction will be carried out by image-classification and machine learning algorithms. The student will be responsible to independently work on the provided data under guidance of the supervisor and to attend weekly meetings with the supervisor. Knowledge in application of ESRI packages (e.g. ArcMap or ArcGIS pro) is required. We will train the student in additional data analysis techniques and their implications for coastal management. Approximately 3-8 hours per week.

Contact: Dr. Christian Schwarz at cschwarz@udel.edu for more information.

EDUCATION

Faculty Mentor(s): Christina Areizaga Barbieri
Hours/Week: 8-10
Dr. Barbieri’s research program centers broadly on instruction for students who struggle in math. Specifically, her work focuses on the evaluation and application of learning principles to improve mathematical competencies and motivation for math, especially for students at risk for low mathematics achievement. Dr. Barbieri studies mathematical competencies from preschool to adulthood. A core part of her work aims to understand how common mathematical errors can be used most effectively to reduce misconceptions and improve learning in math content areas that students commonly struggle with. Recently this has involved both algebra and fractions,
both gateway topics for success in STEM disciplines and careers. Dr. Barbieri also considers the role of motivation and attitudes towards mathematics in student learning.

In Spring 2021, Dr. Barbieri’s various projects on mathematical cognition and learning will have a range of remote activities for an undergraduate scholar to receive mentoring in, such as analyzing students’ problem-solving skills and explanations, reading and coding/note-taking literature, creating databases, and preparing conference submissions. This apprenticeship will be fully remote and mainly asynchronous for Spring 2021, with the exception of about one 1-hour Zoom meeting per week.

Please contact Dr. Christina Barbieri – barbieri@udel.edu for more information. More information about Dr. Barbieri’s lab can be found here: https://sites.udel.edu/barbieri/

**Required Skills**

- Be in good academic standing (GPA of 3.0 or higher)
- interested in student thinking and learning
- Diligent, organized and attentive to detail
- Have good time-management skills
- Have a stable Wifi connection and access to a laptop
- Be able to commit to at least 8 hours a week (up to 10) of work (excluding finals week).

**Recommended Skills**

The following are **preferred** but not required:

- Education, Psychology, or other Social Sciences majors preferred.
- Have experience using Excel.
- Have experience using SPSS or another statistics software.
- Some experience tutoring mathematics (at any grade level)
- Comfortable thinking and talking about mathematics (at various grade levels)
- Interest in attending graduate school
- Availability to stay on for fall 2021 if in good standing.

**MARINE SCIENCE**

Job Description: I am looking to provide a series of opportunities for a student to actively engage in the fields of aquaculture and fisheries through the implementation of several field-based research activities. The potential student will assist with ongoing externally funded, research initiatives including a derelict Blue Crab pot monitoring study in the Inland Bays, a survey of diadromous fishes on Brandywine Creek, remote set oyster and demonstration farm operations and maintaining an educational exhibit on invasive fish species at the Hugh R. Sharp marine science campus in Lewes, DE.
MARINE SCIENCE AND POLICY

**Job Description:** The student will support the work on a model of climate change economics, as part of Dr. James Rising's Open Modeling Group. The model, called PAGE, has been used by the U.S. EPA to estimate the social cost of carbon emissions. The goal of the project is to develop a new version of this model with country-level estimates of climate risk, economic growth, and potential for adaptation and emissions reduction. To do so, the student will draw upon and analyse economic and climate risk data, update model numbers and assumptions, and visualize model results. As part of the job, the student will learn about the model and underlying research, as well as activities to develop future climate and social projections.

**Required Skills:** Quantitative data processing and programming experience. Capacity to self-start.

**Time Required:** 5 - 10 hours per week, with half-hour meetings every week or two.

**To Apply:** Send a letter of interest to James Rising &lt;jrising@udel.edu&gt;

MICROBIOLOGY AND BIOCHEMISTRY

**Project Description:** Background: Research in the Sutherland lab focuses on understanding the molecular mechanisms of cytochrome c biogenesis in bacteria using microbial genetics and biochemistry techniques. What are cytochromes c? They are proteins found in nearly all organisms including humans, plants, and bacteria that function in diverse electron transport chains for cellular respiration. What is cytochrome c biogenesis? Biogenesis is the attachment of heme to cytochrome c, which is required for
their function. While cytochromes c are found in nearly all organisms, there are only three pathways that can perform heme attachment. Understanding how these pathways work is a fundamental biological process. The Sutherland Lab studies the two pathways that are found in bacteria.

**What you will do:** The student will work directly with a graduate student and/or Dr. Sutherland to learn basic research skills. The student will assist on a project characterizing mutants in the active site of a cytochrome c biogenesis protein. The student will learn basic microbiology and molecular biology skills.

**Required Skills:** Background and interest in microbiology or biochemistry. Technical training will be provided. Students interested in graduate school are encouraged to apply.

**Time commitment:** Student will commit to a schedule of ~8-10 hours per week in the lab, to attend a weekly lab-meeting, and to a bi-weekly individual meeting with Dr. Sutherland.

**To apply:** Please email Dr. Sutherland (msuther@udel.edu) with a brief description of why you would like to gain research experience, an unofficial copy of your transcript and your CV/resume.

---

**NEUROSCIENCE**

**Social Neuroscience Research**

The Impression Formation Social Neuroscience Lab ([ifsnlab.org](http://ifsnlab.org)) investigates how we form impressions of people. The lab uses both neuroscience and behavioral research methods. The lab seeks a student for virtual work in the fall to help conduct research online. The student’s responsibilities will include: (1) creating stimuli, (2) conducting online research, (3) cleaning and analyzing data, (4) programming studies, and (5) other miscellaneous tasks.

**Required Skills:** High GPA, attending lab meetings, and a 10 hour a week commitment.

**Email:** jtkubota@udel.edu

---

**NEUROSCIENCE**

**Cognitive Neuropsychology Lab**

**Job Description:** The undergraduate research assistant is responsible for collecting and analyzing data in the laboratory. Responsibilities include assisting with participant recruitment, running experiments, coding data from neurologically-intact and brain-damaged individuals, analysis of structural and functional neuroimaging data, and other day-to-day research needs. The benefits of the position include working closely with graduate students and faculty in a cognitive neuroscience lab, learning about brain stimulation and studying individuals with brain damage, attending weekly lab meetings, and learning more about our cognitive neuroscience research.
Contact Dr. Medina – jmedina@udel.edu

Approximately 5-10 hours of work required per week

**PSYCHOLOGICAL AND BRAIN SCIENCES**

Project: Dozier Lab

Job Description: The undergraduate research assistant will be responsible for preparing salivary cortisol samples for assay, and/or assisting with magnetic resonance imaging (MRI) scanning of infants and adolescents. We conduct randomized clinical trials examining the efficacy of a parenting program developed in our lab, and examine behavioral and biological outcomes of the program. Undergraduate research assistants are needed to help with data collection, and preparation of data for analyses.

Required Skills: High GPA; interest in neuroscience.

Time commitment: 10 hours per week.

Contact mkorom@udel.edu