

## UDRAW FALL 2020 PROJECTS

### ART HISTORY/LATIN AMERICAN AND IBERIAN STUDIES

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#### **Research and Editorial Assistant**

**Job Description:** The research and editorial assistant will work with Dr. Mónica Domínguez Torres in the final production stages of her book *Pearls for the Crown: European Courtly Art and the Atlantic Pearl Trade, 1498-1728*. The book discusses a selection of artworks related to the Atlantic pearl industry in order to show how these under-studied artifacts articulated early modern ideas about imperial expansion, providential wealth, and human mastery over nature, all notions of crucial importance in courtly circles linked to the Spanish Crown. Under Dr. Domínguez's direction, the Undergraduate Research Scholar will be responsible for conducting focused research in early modern inventories; completing bibliographic references; compiling a full bibliography; and creating a permissions log for all the images that illustrate the manuscript (about 150). Training will be provided.

**Required Skills:** interest in Art History, Material Culture Studies, and/or the Early Modern Iberian World; attention to detail; excellent organization skills; ability to work independently

**Preferred Skills:** reading knowledge of Spanish, German, Latin or Italian; familiarity with Google Sheets and Google Docs; good proofreading skills; willingness to work for two semesters.

**Time Required:** Approximately 5 to 10 hours per week, which can be organized according to the student's schedule. Meetings of about 30 min will be held via Zoom every two weeks.

**To Apply:** send a letter of interest listing two references, along with an unofficial transcript, to Prof. Mónica Domínguez Torres ([monicadt@udel.edu](mailto:monicadt@udel.edu)).

### BEHAVIORAL HEALTH AND NUTRITION

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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](mailto:jkkim@udel.edu)) for more information.

## **BIOMECHANICAL ENGINEERING**

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Cartilage Bioengineering Laboratory

**Job Description:** This would be a great opportunity for a student interested in bioengineering research and practices. Student will work with Dr. Lu and graduate students on the fabrication of nanoparticles. The purpose of this project is to make nanoparticles for a controlled release of drugs in human joint for the treatment of osteoarthritis. 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 8-10 hours per week, depending on the student's availability

**Contact:** X. Lucas Lu – [xlu@udel.edu](mailto:xlu@udel.edu)

## **BIOMEDICAL ENGINEERING**

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**Job Description:** This would be a great opportunity for a student interested in biomedical engineering and research. Student will work with Dr. Sambaeta Das on synthetically engineering mammalian cells. The purpose of this project is to make synthetically engineered cells and use microrobots to deliver drugs to the cells. The student will receive all relevant lab trainings. The student can learn mammalian cell culture, transfection protocols and also fabrication of microrobots.

**Required Skills:** Background and interest in bioengineering especially mammalian cell culture. Students interested in graduate school application are preferred.

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

**Contact:** Sambaeta Das at [samdas@udel.edu](mailto:samdas@udel.edu)

## **BIOLOGICAL SCIENCES**

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The goal of this work study opportunity is to revise and develop spreadsheet modules for this website which is associated with the Biological ESTEEM Project: Excel Simulations and Tools for Exploratory, Experiential Mathematics. The project has succeeded over the past 15 years in helping many biologists and biology students appreciate the power and utility of mathematics as well as providing tools for analysis, modeling, and interpretation. These modules have been used by students and professors both nationally and internationally.

Previous students have been recruited for graduate school and work opportunities based on the modules that they developed as part of their portfolio. Students from any major may apply, and both art and engineering students have done exceptional work on this project. (For samples of their work see <<http://bioquest.org/esteem>>. Applicants should have some experience in working with Microsoft EXCEL. Good high school algebra is the only math background required; some programming experience and more mathematics are helpful but not essential.

Please contact [jungck@udel.edu](mailto:jungck@udel.edu) with a copy of your CV and a description of why you would like to be involved with this project.

## **CIVIL AND ENVIRONMENTAL ENGINEERING**

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Laboratory Description: Bacterial life in concrete: How do they do it? The Maresca laboratory studies bacteria in natural and engineered environments, using culture-based laboratory experiments and (meta)genomic analyses of environmental samples. One major project in the lab focuses on bacteria in concrete. Concrete is the most used building material in the world, making it a very common habitat. However, it is hard, dry, salty, and very alkaline – after pouring, the pH of concrete is ~12.4, close to the pH of bleach. Each of these individual factors would make concrete an inhospitable environment to microbes; the combination makes it a very difficult environment to survive in. However, research in my lab has shown that concrete hosts many kinds of microbes, which change as concrete ages. The changes over time imply that at least some of the microbes in concrete are capable of not just survival, but also growth in these challenging conditions.

### Project Description

We are sequencing the genomes of 3 strains of bacteria that we isolated from concrete. With guidance from Dr. Maresca and a graduate student, the undergraduate research assistant will assemble and annotate the genome(s) and analyze them for genes that would help these bacteria tolerate the multiple environmental stresses of concrete. The research assistant will learn

bioinformatics skills, including the software used for quality control of sequence data, genome sequence assembly, and gene function prediction. Some background in microbiology (BISC300 or similar) is helpful, and willingness to learn computational biology is important.

This research will be done remotely, not in-person, but the research assistant will be an integral part of the laboratory group. S/he will participate in weekly lab meetings via Zoom and will talk at least weekly with the graduate student and Dr. Maresca. This project is part of a larger effort to understand how bacteria survive and even grow in concrete, and will make a unique contribution to that research. We expect the student to spend 8-12 hours per week on this research.

Please contact Dr. Maresca ([jmaresca@udel.edu](mailto:jmaresca@udel.edu)) if you are interested in working on this project.

## **EDUCATION**

### **EXAMINING INDIVIDUAL DIFFERENCES IN MATHEMATICAL LEARNING AND COGNITION**

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**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 Fall 2020, 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, creating databases, and preparing conference submissions. This apprenticeship will be fully remote and mainly asynchronous for Fall 2020, with the exception of about one 1-hour Zoom meeting per week.

### **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 Thanksgiving break and finals week).

## Recommended Skills

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

- Have experience using Excel and/or SPSS.
- Some experience tutoring mathematics (at any grade level)
- Comfortable thinking and talking about mathematics (at various grade levels)
- Interest in attending graduate school

Please contact Dr. Christina Barbieri – [barbieri@udel.edu](mailto:barbieri@udel.edu) for more information.

## EDUCATION

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**Job Description:** The undergraduate research scholar will work with Dr. Bryan VanGronigen’s research program, which centers on (a) how to improve schools and (b) how to prepare educational leaders. Depending on interest and/or fit, the scholar is welcome to work on one or more of the following projects:

- *Project A* focuses on school leadership teams (SLTs), which are teams of principals and teachers who lead K-12 schools. We’re interested in learning more about SLT dynamics and how team leaders and team members share power and authority. If joining this project, scholar responsibilities could include assisting with data management, cleaning and analyzing data, and/or writing up findings.
- *Project B* is a study examining how state departments of education assist schools in developing school improvement plans, especially schools labeled as “underperforming.” We’re interested in understanding how states “frame” school improvement planning. If joining this project, scholar responsibilities could include assisting with data collection and management, cleaning and analyzing data, and/or writing up findings.
- *Project C* focuses on state boards of education (SBOEs), which are governmental entities that supervise educational policies in 47 U.S. states. We’re interested in taking a critical look at SBOE members from across the U.S. since some states elect members and other states appoint members. If joining this project, scholar responsibilities could include helping review the literature, assisting with data management, cleaning and analyzing data, and/or writing up findings.

A number of other projects are either in progress or under development, so if a scholar is interested in the research program in general, feel free to reach out to explore potential alignment among interests and work needed.

**Required Skills:** The scholar will join a multi-site research team, and our only required skills are your abilities to work collegially, professionally, and independently.

Preferred Skills: While our team will mentor you with what you need to know, we can move faster if you have a working proficiency of Microsoft Word and Excel and the Google Apps suite (Docs, Sheets, Forms). Moreover, while not required, we'd hope you have an interest in education and educators, even if you're not an education major or minor. All are welcome!

Approximately 3 to 10 hours per week dependent on project workload needs.

Contact Dr. Bryan VanGronigen for more information and/or to apply – [bvg@udel.edu](mailto:bvg@udel.edu)

## **EDUCATION AND PSYCHOLOGY**

Job Description: The Rutherford Lab researches student learning and motivation in online contexts for Pre-K through university students. Current projects include understanding how early elementary student self-regulation develops and relates to instruction during emergency online instruction throughout the pandemic; examining how teachers support upper elementary students' emotions while they work through an online mathematics software; determining how features of a coding course relate to performance between experts and novices; researching how student motivation changes throughout elementary and middle school; understanding how university instructors respond to the shift to online classes; and cataloging school district policies and plans around remote instruction.

The lab is a vibrant research community with postdocs, doctoral students, and undergrads working together toward shared research goals. Weekly lab meetings facilitate problem-solving and sharing across projects. We work hard to develop a work environment (even virtually) that is fun, collaborative, and productive, and is one that supports undergraduate researchers in learning content, skills, and professional norms for Education and Psychology research.

Please contact Dr. Teomara Rutherford – [teomara@udel.edu](mailto:teomara@udel.edu)

## **EDUCATION AND HUMAN DEVELOPMENT**

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Multicultural Education and Literacy Development Lab, MELD

Adrian Pasquarella, Lab Director

The MELD lab engages in collaborative and cutting-edge research intended to improve the educational opportunities, experiences, and outcomes for students from diverse cultural and linguistic backgrounds. If you join our research lab, you will have the opportunity to learn about language and literacy development and instruction for monolingual and multilingual learners. You can gain hands-on research experience with eye-tracking, different types of assessments (cognitive, linguistic, psychological, educational), as well as research design and statistical analysis. Contact [apasq@udel.edu](mailto:apasq@udel.edu) to learn how to join the MELD lab.

We are looking for a student with interest in literacy development for culturally and linguistically diverse students, who can work approximately 10 hours per week. Interest or experience in teaching and learning, or educational and development psychology is desired. Proficiency in a

language other than English is considered an asset. Responsibilities include: attending weekly meetings to discuss the current research projects, administering assessments to children and adolescents, data collection and entry, report writing and knowledge dissemination efforts.

Contact [apasq@udel.edu](mailto:apasq@udel.edu) to learn more about our current research projects.

## **FASHION AND APPAREL STUDIES**

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### **Project 1:**

The Department of Fashion and Apparel Studies Associate Professor Kelly Cobb is seeking work study virtual lab assistants for Fall 2020 in the **Sustainable Textile RAD lab** for Research and Applied Discovery. Cobb's current research threads are listed below-please reach out if you are interested.

[Kcobb@udel.edu](mailto:Kcobb@udel.edu)

<https://www.fashion.udel.edu/people/faculty/kcobb>

**Fashion Hacking for Healthcare:** This research involves market/consumer analysis of virtual fitting Room technology, subscription services and other emerging tools that engage consumers and clothing. Our goal with this research is to hack the emerging tools to create a way for contactless design fitting of healthcare wearables during COVID.

**Tasks:** Market/Consumer research: desktop research, google scholar, reading articles, creating an annotated bibliography and research matrix (Faculty will guide this process.)

**Context:** Kangaroo care (KC), bare skin to skin contact between infant and caregiver, has known short- and long-term health benefits for healthy infants and infants receiving care in neonatal intensive care units (NICUs). An interdisciplinary team of researchers are working on prototype design of a "Snuggle Time Garment" will be conducted first via a virtual fit testing platform by adopting virtual fitting room (VFR) technology used in fashion "hacking" the capability for health-care related device fit testing.

**Required Skills:** We will teach you everything you need to know to work on our research projects. What we really want is for you to have an interest in fashion and the time and ability to analyze emerging writing and concepts. You will need to be able to work independently.

**Time request:** Approximately 5-10 hours of work required per week.

### **Project 2:**

**Re/Cover Textile Product Creation.** This creative design research will focus on sampling (AKA making stuff) textiles from post-consumer waste, product development and consumer education around waste. Outputs of this research will include several prototypes trend research reporting, moodboarding and sketchbook process. And video tutorials of re/cover textile production processes.

**Tasks:** Research assistant will disassemble clothing such as shredding, cutting, and rag processing and to bind fibers such as wet and dry felting, papermaking, knitting, and weaving (this will require assistant has access to creative workspace-nothing is toxic so a home space is fine.) Assistant will conduct trend research, creative process and iteration (from pinterest to little textile sample book) this will require some studio (art, design, textile, fashion, ID) skill in making things and motivation.

**Context:** Redesigning fashion's future offers a vision of a fashion system that is circular, ideally creating no waste by design, while strategically capturing value from recycled content. Radical improvement of recycling by transforming clothing design, collection and reprocessing is the focus of this research as well as determining post-market manufacturing opportunities that re-define the textile waste stream (i.e. deadstock textile and post-consumer garments) as a value stream.

**Required skills:** We will teach you everything you need to know to work on our research projects. This job requires some knowledge and desire to make things (art, design, fashion, other.) This will require (1) trend research and (2) textile sampling. Materials will be provided.

**Time request:** Approximately 5-10 hours of work required per week.

## **HUMAN DEVELOPMENT AND FAMILY STUDIES**

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**Job description:** Dr. Barnes' research program centers broadly on the social and emotional well-being of diverse student populations and educators.

Depending on interest and/or fit, the undergraduate scholar is welcome to work on one or more of the following projects:

*Project A* is a study that will examine the use of social and emotional learning interventions for students with disabilities. If joining this project team, scholar responsibilities could include helping review the literature, assisting with article coding, reference sorting, and/or writing up findings.

*Project B* is a study focusing on teacher and assistant teacher collaboration in preschool settings. If joining this project team, scholar responsibilities could include teacher and assistant teacher video observation, coding videos using a researcher-created measure, and writing up findings.

*Project C* is support with dissemination of research findings. If joining this team, scholar responsibilities could include reviewing relevant literature, crafting social media posts, writing blog posts about findings.

**Required Skills:** The scholar will join a multi-site research team, and our only required skill is your ability to work collegially, professionally, and independently.

**Preferred Skills:** While our team will mentor you with what you need to know, we can move faster if you have a working proficiency of Microsoft Word and Excel and the Google Apps suite (Docs, Sheets, Forms). Moreover, while not required, we'd hope you have an interest in social-emotional wellness and childhood. You do NOT need to be an education or HDFS major. All are welcome!

Approximately 10 hours per week dependent on project workload needs.

Contact Dr. Tia Barnes for more information and/or to apply – [tnbarnes@udel.edu](mailto:tnbarnes@udel.edu)

## **HUMAN DEVELOPMENT AND FAMILY STUDIES**

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### Job Description:

Preventing Expulsion And Ssuspension through Policy Alignment and Cohesion (PEASPAC) is a research project focused on examining state level policies governing early childhood care and education services put in place to prevent exclusionary discipline in the form of suspensions and expulsions. Policies that prevent suspension and expulsion are really important to have in place because boys and children of color, especially African American children are disproportionately targeted by exclusionary discipline practices. The policies that prevent this from happening are found in state Child Care Development Funds (CCDF) plans, State Child Care Licensing regulations, State Quality Rating and Improvement Systems standards, and State Pre-K Policies.

Working with a faculty mentor, the undergraduate student on this project area will participate in creating research databases, data collection, developing data codes, coding data and research discussions with faculty and graduate students. The student will be responsible for finding state level policies, entering the data into data bases, and attending regular research meetings. We are looking for a student who is punctual, a self-started, and interested in learning new policy and research skills. You must have a working internet connection so that you can participate in Zoom meetings. While our team will mentor you with what you need to know, we can move faster if you have a working proficiency of Microsoft Word and Excel. Moreover, while not required, we'd hope you have an interest in young children or public policy or both. All are welcome!

Approximately 8-12 hrs required per week.

Contact Prof. Martha Buell [mjbuell@udel.edu](mailto:mjbuell@udel.edu) for more information

## **LINGUISTICS AND COGNITIVE SCIENCE**

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### **UD PhonLab (PI Dr. Kathryn Franich) Position 1:**

Student will help to recruit, schedule, and run participants for research studies and regularly check the lab's email account. Occasionally, the student may also be asked to make small updates to the lab's website (in WordPress) or to organize equipment in the lab. The benefits of the position include working closely with the PI and graduate students to learn about how behavioral research is conducted, and participating directly in data collection.

#### **Required Skills:**

Strong interpersonal and organizational skills are preferred. Interest in linguistics (or language research, more generally) is a bonus.

#### **Time Commitment:**

Approximately 5 hours of work required per week.

*Please reach out to the PI at [kfranich@udel.edu](mailto:kfranich@udel.edu) if you are interested in the position.*

### **UD PhonLab (PI Dr. Kathryn Franich) Position 2:**

#### **Job Description:**

Student will help to annotate acoustic data in Praat for research studies. They will gain direct experience with linguistic data and will have the opportunity to learn some basic database and data cleaning skills commonly needed in the behavioral sciences.

#### **Required Skills:**

Some coursework or training in phonetics is ideal (e.g. having taken LING/CGSC 353), including experience with Praat software.

#### **Time Commitment:**

Approximately 5-10 hours of work required per week.

*Please reach out to the PI at [kfranich@udel.edu](mailto:kfranich@udel.edu) if you are interested in the position.*

## **MATERIAL SCIENCE AND ENGINEERING**

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Job description: The undergraduate assistant will work with the Law lab graduate students to perform data analysis on a wide range of data types and samples. This project does not require lab access and will be done remotely. This will include analyzing average particle size and density of self-assembled nanoparticles from atomic force microscopy scans, extracting the optical properties of semiconductor films and layered structures from spectroscopy scans,

determining layer thicknesses and interface thicknesses of multilayer films from x-ray diffraction measurements, and possibly other data analysis as the need arises. The student will be responsible for maintaining a lab notebook, presenting results clearly, backing up data on the group network share, and attending meetings. We will train the student in all data analysis techniques so no previous knowledge is required, though an interest in materials science or related disciplines is preferred.

Approximately 3-8 hours per week. Contact Prof. Stephanie Law at [slaw@udel.edu](mailto:slaw@udel.edu) for more information.

## MECHANICAL ENGINEERING

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### **Properties of 3D printed biomaterials:**

*Job Description* -- We are looking for a few students to help us conduct some literature search and prepare review reports relevant to the mechanical and electronic properties of 3D printed biomaterials. Students with an interest in fundamental research and/or an interest in making contributions to manuscript preparation for journal publications are encouraged to apply. The student will work in the Department of Mechanical Engineering at the Laboratory of Mechanics and Physics of Heterogeneous Materials. If there are any questions regarding the position, please send an email to [zubaer@udel.edu](mailto:zubaer@udel.edu) with a subject UDRAW-Application.

*Requirements* -- Background and interest in physics, chemistry, biomaterials, mechanics, or materials.

*Time commitment* -- Approximately 5 to 10 hours per week, depending on the student's availability.

### **Solid Mechanics:**

*Job Description* -- We are looking for a student to help us collect and convert some resources on various topics of Solid Mechanics into LaTeX format documents. Students with an interest in mathematical aspects of solid mechanics are encouraged to apply. The student will work in the Department of Mechanical Engineering at the Laboratory of Mechanics and Physics of Heterogeneous Materials. If there are any questions regarding the position, please send an email to [zubaer@udel.edu](mailto:zubaer@udel.edu) with a subject UDRAW-Application.

*Requirements* -- Background and interest in mechanics and/or materials.

*Time commitment* -- Approximately 5 to 10 hours per week, depending on the student's availability.

## MEDICAL ANTHROPOLOGY AND MICROBIOME RESEARCH

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The undergraduate research scholar(s) will work with Dr. Melissa's Melby research program, which explores how biological and cultural factors influence health across the lifespan, with a focus on how the microbiome (the genes of microbes living in or on our bodies) may mediate social and physical environmental factors into bodily function and health outcomes.

**Background:** Human microbiome research has turned biomedical and environmental understandings on their proverbial heads. Instead of thinking of all bacteria as potential pathogens, we now recognize that most are neutral and many are beneficial, and that the effects of the microbiome extend beyond the gut to many organs and locations, including the brain. This paradigm shift from 'risk' to 'resilience' is reflected in changes from an 'us vs. them' mentality to a focus on symbiosis between humans and other organisms, and from warfare metaphors to ecological metaphors in lifestyles and behaviors (ranging from birthing and infant feeding practices to uses of antibiotics). This is particularly timely research during the COVID-19 pandemic, where we struggle to 'fight' the virus with increased sanitizing efforts, and where pre-existing conditions linked to microbiome dysbiosis (or imbalance) may increase vulnerability to disease or death. While much of human microbiome research has focused on individuals and their resident microbial diversity, we are beginning to investigate the connections with the environment and the larger social community.

*A number of projects are either in progress or under development, so if a scholar is interested in the research program in general, feel free to reach out to explore potential alignment among interests and work needed.*

**Required Skills:** The only required skill is your ability to work collegially, professionally, and independently.

**Preferred Skills:** While we will mentor you with what you need to know, we can move faster if you have a working proficiency of Microsoft Word and Excel and the Google Apps suite (Docs, Sheets, Forms). Moreover, while not required, we hope you have an interest in anthropology, public health, and/or the microbiome, even if you're not an anthropology / biology / public health major or minor. All are welcome!

**Time Required:** Approximately 5 to 10 hours per week dependent on project workload needs. (will meet with mentor for 30 min/week via zoom, with additional email communication)

**To apply:** Please send letter of interest, unofficial transcript, and one letter of recommendation to Dr. Melissa Melby ([mmelby@udel.edu](mailto:mmelby@udel.edu)).

**Projects (click on highlighted titles for detailed descriptions in Google docs):**

1. **Biocultural Perspectives on Aging: Importance of the Microbiome** (Research & Writing project – background for research project in development)
  - a. Literature reviews for chapter in Anthropology of Aging edited volume – involving learning how to use RefWorks and library databases for research
  - b. Possibility of participating in research design and early stages for project in development examining changes in microbiome among older people living in care homes, and the staff who work there.
2. **Engaging Public Health Perspectives for Translational Microbiome Research** (Research project underway)
  - a. Literature reviews
  - b. Pilot testing of media, images, questions
  - c. Transcription of interviews
  - d. Analysis
3. **Indigenous Understandings of the Microbiome as Key to Resilience and Health Equity** (Research project at early stages)
  - a. Literature reviews for grant and paper writing and questionnaire development
    - i. Indigenous understandings of ecology and aging
    - ii. Indigenous health inequities
  - b. Possibility of conducting pilot tests of interviews with members of local indigenous groups (Lenape)
4. **Environmental health and the microbiome** (Research and development of public health modules for critical thinking skills around microbiome and environment)
  - a. Literature review
  - b. Research questions
  - c. Problem-based learning curriculum design
5. **Biocultural factors influencing menopause** (Research analysis and writing project – for chapter and book in progress)
  - a. Literature review for chapter and book
  - b. Analysis of already collected data (if have relevant skills in statistical analysis, or are interested in learning)

## **MEDICAL AND MOLECULAR SCIENCES**

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Esther Biswas-Fiss, Ph.D. - Translational Genetics Lab

The Biswas-Fiss lab uses biotechnology-based approaches to investigate the structure and function of proteins and their role in human health and disease. In particular, we focus on the translational genetics of inherited visual disease to provide develop enhanced diagnosis and therapeutic approaches.

**Primary Function:** Assist principal investigator in routine laboratory procedures.

**Duties and Responsibilities:**

### ***Wet Lab***

- Prepare solutions and media
- Culture bacteria
- Contribute to literature collection and review.
- Autoclave media, plasticware and glassware.
- Prepare solutions and glassware.
- Assist with basic molecular biology and biochemical research procedures – transformation of *E. coli*, preparation of genomic and plasmid DNA, SDS-PAGE, protein purification, antibody production and Western Blot analysis.
- Production of recombinant proteins in a variety of systems

### ***Dry Lab***

- Computer searches, data analysis and data entry.
- Literature review
- Method validation
- Bioinformatic analyses

Interested students should reach out to:

Contact information: [ebiswas@udel.edu](mailto:ebiswas@udel.edu) (Principal Investigator)

[jspjones@udel.edu](mailto:jspjones@udel.edu) (Lab Manger)

## **MUSIC THEORY**

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### **Music Theory ("Database Creation: A Corpus Approach to Contra Dance Tunes")**

**Job Description:** The undergraduate research assistants on this project will assist with creating a database of contra dance tunes using a symbolic music encoding system (training will be provided). Students will work independently to encode tunes and will confer with their teammate(s) as needed to deal with the more subjective portions of the encoding. Each student or team of students will have a bi-weekly check-in with the project supervisor, either by email or by videoconference. A hard copy of the sheet music to be worked with will be provided to each student, to be returned when the project is completed.

**Required skills:** Computer data entry (training on music encoding will be provided), ability to read music (single-line textures, treble clef). Since work will primarily be independent and

remote, applicants should be motivated self-starters with the ability to problem solve on their own when possible, and able to clearly communicate about problems when help is needed. Data entry will need to be done in Notepad or another similar program, and files will be shared via Google Drive.

**Preferred skills (not all research assistants will need to have these skills):** Ability to recognize motivic structures and phrase structures (in relatively simple and short pieces) and to translate lead sheet notation into Roman numeral notation. Recognition of a shift in tonal center indicated by changes in Roman numerals is also preferred; coaching can be provided on this skill.

Time commitment: 2-10 hours per week

Contact Dr. Jennifer Shafer: [shafer@udel.edu](mailto:shafer@udel.edu)

## **PHYSICAL THERAPY**

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**Project 1: Job Description** - The Delaware Limb Loss Studies research laboratory is dedicated to advancing clinical care and technology for adults with lower-limb amputation and limb-difference. Under the direction of Dr. Megan Sions, PT, DPT, PhD and her research team, the undergraduate research assistant will aid in participant recruitment, data collections, data entry and management, Institutional Review Board compliance, and archiving of study materials. The undergraduate research assistant may observe and participate in monthly University of Delaware Amputee Clinics, which provide evaluations to individuals seeking new or replacement prosthetic components following limb amputation. Depending on the student's interest and/or fit, the individual may work on one or more of the laboratory's projects. For details about ongoing projects see <https://sites.udel.edu/pt/research/sions-research-2/>

**Required Skills and Experience:** Strong interpersonal and organization skills are necessary. The student must have experience with using Microsoft Excel.

Ideally the student will work 5-10 hours/week.

Contact Dr. Megan Sions for more information – [megsions@udel.edu](mailto:megsions@udel.edu)

**Project 2: Job Description Research assistant for Move to Learn Innovation Lab** - The Move to Learn Innovation Lab is located in Star Campus. Our Super Suits FUNctional Fashion and Wearable Technology Program focuses on designing garments to help improve quality of life for people with disabilities.

We are seeking one or two undergraduate research assistants to engage in a variety of research activities with our team. Our team's current projects focus on early intervention, parent education, and rehabilitation technology. Students will assist in a variety of tasks, including coding of data from videos of parent-child activity or apps about child development and play,

digitally gathering scientific articles, and data processing and organization. No prior experience with these tasks is required as training will be provided. Training and work can be performed remotely as necessary during the Covid-19 crisis.

The benefits of the position include working with our interdisciplinary team members to learn more about how to scientifically design interventions and clothing that support and assist movement for children with disabilities and participation in a supportive environment with students pursuing a variety of careers in health sciences.

Approximately 8-10 hours of work required per week.

## **PHYSICAL THERAPY**

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### **Move2Learn Autism Lab at the University of Delaware's Physical Therapy (PT) Department is looking for student researchers.**

University of Delaware's Move2Learn Lab (PI, Anjana Bhat) is looking for student researchers who can use their work study hours (4-8 hours per week) towards conducting research understanding behaviors of children with Autism Spectrum Disorder (ASD). They will be part of a collaborative research team of graduate and undergraduate students and will assist in recruiting and scheduling participants, and collecting/analyzing data.

The primary ongoing project is the Play & Move Study where we are providing 8-week of creative movement (play) or general movement (exercise, ball skills, relay games) or seated play (create using reading, building, and art-craft) interventions to children with ASD to study its effects on social communication and motor skills. A lot of data will be collected and we are looking for help to complete recruitment, screening, and data analyses/processing through behavioral coding and excel-based data entries.

Interested students should contact Dr. Bhat at [abhat@udel.edu](mailto:abhat@udel.edu) to get more details on the position. We would love to get a reference from someone you have worked with and a resume describing your past pediatric, research, or managerial skills.

Lab Webpage: <https://sites.udel.edu/pt/research/anjana-bhat-ms-pt-phd/>

## **PLANT AND SOIL SCIENCES**

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### **Delaware Indoor Ag Lab – Research Assistant**

**Job description:** [Delaware Indoor Ag Lab](#) – Research Assistant (RA). A new indoor farming laboratory is currently under development to enable research on hydroponic crop production in controlled environments. The RA will engage in environmental plant physiology research on light, mineral nutrition, and other environmental factors and run hydroponic systems to grow leafy greens, culinary herbs, and microgreens. The RA will work directly with the principal investigator to 1) help set up and test hydroponic systems (e.g., installing system components and conducting plant trial runs); 2) provide plant care (e.g., watering, making and refilling nutrient solutions, and measuring pH and EC); 3) maintain lab cleanliness (e.g., cleaning hydroponic components); 4) help with experimental setup; and 5) collect and enter research data for analysis. The RA will gain interdisciplinary experience in both research and operation capacities in preparation of graduate studies or industry work in the realm of agriculture, plant science, and engineering.

**Requirements:** The motivated individual is interested in this research, punctual, willing to learn, meticulous with great attention to detail, handy with building tools and technical equipment, skilled at solving problems, experienced with data entry and organization in Excel, able to move heavy objects (up to 50 lbs.), and able to work on weekends. Direct plant experience is preferable but not required.

**Time commitment:** The position requires 3 to 10 hours of work per week, which can fluctuate depending on tasks.

**Contact:** Dr. Qingwu Meng ([qwmeng@udel.edu](mailto:qwmeng@udel.edu)). Please include a letter of interest, an unofficial transcript, and two references.

## **PSYCHOLOGICAL AND BRAIN SCIENCES**

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### **Project 1: Medina 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.

Approximately 5-10 hours of work required per week.

### **Project 2: Social Neuroscience Research Assistant Job Description**

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

## PUBLIC POLICY AND ADMINISTRATION

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### Climate Adaptation Policy and Practice

Dr. Siders' research focuses on how coastal and river communities are preparing for sea level rise, hurricanes, floods and other climate change-related hazards. Depending on interest or fit, a student would be welcome to work on one of more of these projects:

- *Case studies of retreat.* As coastal storms and floods become more severe, some homeowners and towns are considering moving away from the shore: a process called managed retreat. There are examples of managed retreat from all over the U.S., but little is known about them. We'd like to be able to learn from their experience, so an RA would help research one or more of these case studies to help improve others' programs. This may involve interviews, analyzing survey results, researching government records, or GIS mapping and analysis. This project is in collaboration with a large environmental non-profit, so the student will gain insight into large environmental non-profit practices.
- *Media analysis of retreat.* Newspapers reporting on retreat have a hard time staying neutral – they are often for or against retreat. A national group of scholars would like to study how the media portrays retreat and why (does it vary by geography, by newspaper?). First, we need help collecting the relevant news articles and creating a database that can be used for analysis. A student would need to be highly organized. The student would meet with our academic group of PhD students and professors to learn about research approaches in other disciplines.
- *Adaptation laws.* A large environmental law organization is preparing a treatise on climate change law, and I am helping to write the adaptation chapter. This chapter has a great deal of overlap with U.S. disaster law and policy. A student would help by researching recent publications on U.S. disaster response law and policy. If they are interested, they could also draft sections of the chapter. This would be a good experience for anyone considering law school. Dr. Siders is a lawyer and could provide advice.

Approximately 10 hours a week, depending on project workloads. I would also invite the student(s) to join our weekly research lab meetings, where they would learn about other projects and meet graduate students who could serve as peer mentors.

Skills: A student must be organized, independently motivated, and willing to ask for help before a problem becomes a crisis. Some proficiency of Excel, Google Scholar (or Web of Science), would be a plus. Students who have not completed human subjects training may be required to do this as their first project.

Contact Dr. Siders for more information / to apply – [siders@udel.edu](mailto:siders@udel.edu)

## **PUBLIC POLICY AND ADMINISTRATION**

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Isett/Toth Policy Lab – Biden School of Public Policy and Administration

Job description: The Isett and Toth Policy Lab focuses on, but is limited to, issues around healthcare access and racial and gender disparities. We have a number of projects that are in need of data collection and data tabulation. Students will likely work on a number of different projects throughout the year. Our lab's current projects include:

1. Physician capacity in Delaware and access to languages other than English
2. Collaboration among community organizations responding to the opioid epidemic in North Carolina
3. Race and gender patterns in academic research
4. Delivery of vaccines in low and middle income countries
5. Use of scientific knowledge in policy making
6. Profiles of productivity in academic research

Required skills: Most skills needed will be taught in the lab setting, but attention to detail is extremely important. Some introductory statistics is preferred. Need to work independently.

Time commitment: 2 students at 10 hours per week each. UDRAW students will work collaboratively with students at all levels of education within UD.

Contact: Please contact Drs. Isett ([kri@udel.edu](mailto:kri@udel.edu)) and Toth ([tibi@udel.edu](mailto:tibi@udel.edu)) if interested.

## **SOCIAL INNOVATION AND ENTREPRENEURSHIP**

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The undergraduate research assistant would be responsible for assisting with a variety of research and administration related to entrepreneurship, leadership, and social impact topics. Tasks may include finding and summarizing articles within an annotated bibliography, compiling information or resources, giving feedback on written exercises, and doing website-based research.

5-10 hours required per week

Contact Dr. Stephanie Raible for more information to apply – [sraible@udel.edu](mailto:sraible@udel.edu)

## SPECIAL EDUCATION

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This internship research assistantship will provide an opportunity for undergraduate students to work on three projects related to autism disorder and other developmental disabilities. In addition to these projects, additional work may arise throughout the course of the semester but will be related to these same themes. Each project will provide an opportunity to engage in stakeholder informed, applied research. Students will work approximately 3 to 10 hours per week dependent on project workload needs.

**(1) Understanding Stakeholder Engagement in the Process of Conducting Autism Research.** Tasks related to this project include creating a database of autism scholars and creating an online questionnaire.

**(2) The Birds and the Bees: Building Capacity for Sex Education for People with Disabilities.** Tasks related to this project include creating online content on the topic of sex education for people with disabilities, finding scientific articles about sexuality and disability and summarizing their findings, and introductory level qualitative data analysis.

**(3) Examining the Feasibility and Efficacy of an Online Toolkit for Supporting Families with Children on the Autism Spectrum with Mealtimes.** Tasks related to this project include finalizing the toolkit, developing an email delivery system, and building online surveys.

**Required Skills:** Interest in Autism | Attention to Detail | Organized | Ability to Work Independently | Willingness to Learn | Interest in Research Methods

**Preferred Skills:** Familiarity with Google Sheets | Good Proof Reading Skills | Research Experience | Autism Experience | Willingness to Work for Multiple Semesters

To Apply Contact Sarah Curtiss at [curtiss@udel.edu](mailto:curtiss@udel.edu). To learn more about her research visit, [autismincontext.org](http://autismincontext.org)