

# 2018 Summer Research Project Descriptions

## St. Croix Campus

Mentor Name: Bernard Castillo II

Location: St. Croix

Project Description: Plants produce a diverse phenolic compounds that contain one or more acidic hydroxyl residues attached to an aromatic ring. Some examples include, hydroxycinnamic acids, flavonoids, anthocyanins and tannins, which represent the major classes of phenolic compound in the biosphere. These phenolic compounds have many functions in plants, including acting as antioxidants. Our group has developed a methodology to determine the total antioxidant activities of plants. We would like to determine the correlation between total phenolic compounds and antioxidant found in plants.

Slots: 4

Student requirements: Hard working, punctual, detailed worker in the laboratory, able to read and understand scientific journals, trainable and willing to present our work.

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Mentor Name: Andrew Gard

Location: St. Croix

Project Description: We will use the Matlab/Octave programming environment to study plane curves described in bipolar coordinates, a system with applications in mathematical physics. Time permitting, we will explore possible connections between bipolar coordinates and inversive geometry.

Slots: 3 maximum.

Student requirements: Strong performance in calculus I is a minimum prerequisite. Motivation to master new technical skills is also a requirement. Further mathematical coursework is desirable.

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Mentor Name: Chris Plyley

Location: St. Croix

Project Description: Do Crucian speakers learn mathematical concepts better when they are presented in Crucian? Although the use of creole and other non-standard language varieties in educational environments is often criticized (Torres and Torres 2012), linguistic research in education often shows positive outcomes in students' learning when they are taught in their native language variety (Wigglesworth et al. 2013). This exploratory project will initiate a study using native speakers of Crucian creole who will watch a video tutorial presenting a novel mathematical concept. The video will be recorded in either Academic English or using a Crucian dialect. After watching the tutorial, participants will be assessed on their level of comprehension of the concept. This study has ramifications in the fields of mathematics education and linguistics.

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Slots: 2-3

Student requirements: Students required for study design, data collection, data analysis. Success in MAT 235 strongly preferred. Knowledge of Crucian language variety an asset but not required.

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Mentor Name: Janis M Valmond

Location: St. Croix

Project Description: There are two research projects, both secondary data analyses, planned for the summer: data generated by the Youth Risk Behavior Survey scheduled for completion in the territories public schools in May-June 2018 by the Caribbean Exploratory Research Center on behalf of the VI Department of Health; and data from the 2016 Behavior Risk Surveillance Survey for the USVI, completed by the VI Department of Health. to explore the prevalence of various chronic diseases (cardiovascular disease, diabetes, cancer) in the USVI. The ECS mentee, if assigned, will be guided through the full research project, from development of the research question(s) to the written report and poster presentation. The mentee would also be given co-authorship on any manuscript developed from the work completed.

Slots: 1

Student requirements: Excellent computer, written and oral communication skills

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Mentor Name: Timothy Kentopp

Location: St. Croix

Project Description: Title: A Pilot Assessment of USVI Cybersecurity Exposure

Research Question: Given local conditions and recent trends, are USVI residents at higher risk for cyber attacks?

Specifics: Internet services offered in the US Virgin Islands differ from online resources in the US mainland. Vicious new botnets such as Merai are designed to exploit connected smart home devices. These research activities provide the basis to assess whether USVI residents are at higher risk for cyber attacks. Two related topics for investigation will be offered, one centered on the human, the other centered on service.

1. User perceptions of personal technology exposures and threats.
2. Internet service providers: building a catalog of network & cyber profiles.

Slots: Four total, on either/both islands.

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Student requirements: Previous coursework in statistics, computer science, information systems, technology, cybersecurity, communication, and social sciences is helpful, though not required. A commitment to recruit willing subjects, conduct live surveys, collect, anonymize, r

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Mentor Name: Marcia Taylor

Location: St. Croix

Project Description: Marine debris outreach

Slots: One

Student requirements: Interest and enthusiasm

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Mentor Name: Dr. Amy J. Dreves

Location: St. Croix

Project Description: 1. Creation of insect displays, pest management education cards, documenting and processing insect submissions, gathering local remedies for treating pests, and organizing retrieval and lending in our science library

Slots: two

Student requirements: detailed, interest and lack of fear of insects, creative, reliable

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Mentor Name: Donald Bailey

Location: St. Croix

Project Description: NFT Hydroponic vegetable production nutrient comparison research

Slots: 2

Student requirements: Ability to keep accurate data, spreadsheet data entry and analysis, chemistry lab experience or computer programming (Arduino) experience.

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