Eleventh Annual
Queensborough Community College

HONORS CONFERENCE

MAY 1ST, 2015
11:00 A.M. TO 5:00 P.M.
MEDICAL ARTS BUILDING

PARTICIPATING COLLEGES

BOROUGH OF MANHATTAN COMMUNITY COLLEGE
BRONX COMMUNITY COLLEGE
BROOKLYN COLLEGE
EMPIRE STATE COLLEGE
Kingsborough Community College
QUEENS COLLEGE
Queensborough Community College
ELEVENTH ANNUAL HONORS CONFERENCE

May 1st, 2015

11:30 a.m. to 12:30 p.m. Registration / Lunch
Medical Arts Building, Well Area

12:30 p.m. to 1:00 p.m. Welcoming Remarks
Medical Arts Building, Room 136

Dr. Diane Bova Call
President of the College

Dr. Paul Marchese
Provost and Vice President for Academic Affairs

Dr. Paris Svoronos
Chair of the Honors Committee

1:00 p.m. to 5:00 p.m., Concurrent Presentations, Medical Arts & Science Buildings
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### Faculty Mentors

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<td>Dr. Zeynep Akcay</td>
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<td>Dr. Shele Bannon</td>
<td>Department of Business</td>
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<td>Dr. Sunil Bhaskaran</td>
<td>Department of Physics, <em>Bronx Community College</em></td>
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ABSTRACT

PRESENTATIONS
Chemical Properties of Fertilizers and its Impact on People, Vegetation and the Ground

**Presenter:** Fadwa Abdelqader  
**Faculty Mentor:** Dr. Dominic Hull
**Department of Chemistry**

**Abstract:**

In this presentation the chemical properties of fertilization and its impact on the ground, the vegetation and people will be addressed. The presentation will also deal with the synthesis of fertilizers. The discussion will focus on the initiation (placing the fertilizer in the ground) and the various steps involved until the resulting food reaches a person’s household. Particular emphasis will be placed on its influence on the size of the vegetation, the amount of time it takes for the plant to grow as compared to natural growing and the difference in taste. Will the use of a fertilizer lead to its presence on the plant until consumption or will it remain until the final growth of the plant? What is the overall effect and consequence of fertilizers on people’s health? These are some of the questions that will be addressed.

Characteristics and Side Effects of Exposure to Different Chemical Agents (Weapons)

**Presenter:** Koma Budhu  
**Faculty Mentor:** Dr. Dominic Hull
**Department of Chemistry**

**Abstract:**

The exposure to different chemical agents such as nerve (VX and sarin), blister (mustard gas), choking (chlorine gas) and blood poisons (hydrogen cyanide) will be discussed. The causes that lead to a variety of symptoms on their victims will be analyzed. Moreover in this presentation the side effects of exposure to these chemical agents, their symptoms, immediate and long term treatment as well as brief details of several listed poisons will be presented.
Diabetes
Presenter: Jessica Cruz
Faculty Mentor: Dr. Dominic Hull
Department of Chemistry

Abstract:

Diabetes is a disease that affects millions of people at any age and anywhere in the world. There are two main types of diabetes. The first one, Type 1, which is the most common autoimmune disease, also known as generic diabetes, results from insulin deficiency. The second one, Type 2 is insulin resistance which normally results due to poor diet and excess weight. Untreated, the consequences of Type 2 diabetes can be life threatening, as the beta cells in the body fail to keep up and are resistant to the demand and effects of insulin. Insulin is a peptide hormone produced by beta cells in the pancreas. Its function is to regulate the metabolism of fats and carbohydrates by promoting the absorption of glucose from the blood to skeletal muscles. It also inhibits the production of glucose by the liver.

Molecular Detection of Virulence Genes Associated with Pathogenicity of Gram Positive Bacteria
Presenter: Carolyn Curtis
Faculty Mentor: Dr. Dominic Hull
Department of Chemistry

Abstract:

Staphylococcus and Streptococcus are a group of bacteria that cause a wide array of trouble to its victims such as septicemia, endocarditis, wound infections, and pneumonia in animals and humans. These bacteria have the ability to act as opportunistic pathogens that create havoc upon its host and simply become a nuisance. This presentation aims to explore the virulence genes and pathogenicity of gram positive bacteria. Nasal swabs and tissue samples were collected to be analyzed and screened for microbial pathogens as done by the authors. In addition, these samples were further screened with PCR in order to detect gram positive bacteria as per work done by Aher et al. In total 57 out of 144 isolates were gram positive pathogens. This is gathered on the basis of gram staining, cultural identification, biochemical characters and morphology, methods used by the authors as techniques to analyze virulence and pathogenicity of bacteria. It was determined that 11.6% were found to be positive for Coagulase gene (bacterial enzyme that brings about coagulation of blood and/or plasma produced by disease-causing forms or Staphylococcus); 25.6% were positive for the clfA gene. Finally, 32.6% of isolates tested positive for Spa gene. As a result the presence of these genes offers confirmation that gram positive pathogens reserve pathogenic potential.

The Chemistry of Fireworks

**Presenter:** Medina Hazin  
**Faculty Mentor:** Dr. Dominic Hull  
**Department of Chemistry**

**Abstract:**

Fireworks need a source of raw material for energy such as black powder, a mixture of charcoal, sulfur, and saltpeter (common name for potassium nitrate) or smokeless powder such as cellulose nitrate. In addition, fireworks contain substances that give off bright, colorful light when heated. A common example of such material is sodium in table salt. If salt is sprinkled into a flame, an orange color appears. The colored flame is a result of electrons in sodium ions absorbing energy and moving up to higher energy levels and then falling back to their ground state, emitting specific amounts of energy that correspond to colors of light. For centuries, this phenomenon has been the basis of flame tests in chemistry laboratories.

BHA and BHT Synthetic Preservatives and Cancer

**Presenter:** Aneesa Ingram  
**Faculty Mentor:** Dr. Dominic Hull  
**Department of Chemistry**

**Abstract:**

Butylated Hydroxyanisole (BHA) and Butylated Hydroxytoluene (BHT) are artificial antioxidants that are commonly used together as preservatives in foods as well as cosmetic products such as moisturizers and lipstick. BHA is a white yellow solid and is a mixture of the isomers 3-tert-butyl-4-hydroxyanisole and 2-tert-butyl-4-hydroxyanisole. Also known as BOA, tert-butyl-4-hydroxyanisole, (1,1-dimethylethyl)-4-methoxyphenol, tert-butyl-4-methoxyphenol, antioxyne B. BHA has a molecular compound of \( \text{C}_{11}\text{H}_{16}\text{O}_{2} \). BHT is a white powdery substance also known as 3,5-di-tert-butyl-4-hydroxytoluene; methyl-di-tert-butylphenol; 2,6-di-tert-butyl-para-cresol and has the molecular compound of \( \text{C}_{15}\text{H}_{24}\text{O} \). BHA and BHT can be human carcinogens and eventually cause tumors. Furthermore BHA and BHT can greatly affect the endocrine system organs such as, the kidney, liver, thyroids and affect hormones that can cause other health and behavior issues within males and females. This is important because the majority of the society buy products that are rich in antioxidants but are unaware of the harmfulness of those products. This presentation will discuss the molecular make up of these chemicals, review the products we are familiar with and can find at our supermarkets and/or drug stores and review the side effects of these chemicals BHA and BHT.
Caffeine Addiction
Presenter: Calvin Li
Faculty Mentor: Dr. Dominic Hull
Department of Chemistry

Abstract:

Caffeine addiction is one of the most widespread addictions throughout the world that is not taken very seriously by people. Caffeine is an alkaloid, also known as a natural amine derivative that is found in common beverages such as tea, coffee, and sodas. It is a psychoactive drug that may cause harm to the human body and lead to addiction. In most countries of the world, caffeine is consumed on a daily basis with the FDA reporting that more than 80% of Americans consume caffeine daily. When a human consumes caffeine, it gets absorbed into the small intestine and later dissolves into the bloodstream. Caffeine is a chemical which is both water and fat-soluble, and this allows the caffeine to enter the brain. As people drink caffeine, they build up tolerance to this drug which over time, shows no benefits to an individual’s health. This presentation will focus on how caffeine affects the human body leading to addiction.

The Impact of Pesticides on Human Beings
Presenter: Vickram Niranjan
Faculty Mentor: Dr. Dominic Hull
Department of Chemistry

Abstract:

Do the chemicals that compose pesticides affect the human body positively or negatively? Pesticides are toxic substances released intentionally into our environment to kill living organisms and prevent diseases. This includes substances that kill weeds (herbicides), insects (insecticides), fungi (fungicides), rodents (rodenticides), and others. The use of toxic pesticides to manage pest problems has become a common practice around the world. Pesticides are used almost everywhere -- not only in agricultural fields, but also in homes, parks, schools, buildings, forests, and roads. Some have been linked to a wide range of human health hazards, ranging from short-term impacts such as headaches and nausea to chronic and devastating impacts such as cancer. The different of some representative pesticides and their effect on the human body will be discussed.
The Biochemistry of Cholesterol

Presenter: Maureen McDonnell
Faculty Mentor: Dr. Dominic Hull
Department of Chemistry

Abstract:

Cholesterol is an essential nutrient that our body needs so that it can function normally. Cholesterol, C_{27}H_{45}OH, is composed of a hydrocarbon tail, a ring structure with 4 hydrocarbon rings and a hydroxyl group. A closer look into the biochemistry of cholesterol, shows us that this nutrient is necessary for hormone manufacturing, digestion, and as a structural component in our cells. Information on cholesterol levels and discussion of two types of lipoproteins, low-density lipoproteins (LDLs) and high-density lipoproteins (HDLs) will be presented. Risk factors of high cholesterol, such as, smoking, obesity, poor diet, lack of exercise, and diabetes do pose significant health risks. One of the most significant risks of high cholesterol is heart disease. There are steps one can take to lower the cholesterol level, such as losing weight, eating heart healthy foods, exercising and quitting smoking. In conclusion, cholesterol while a necessary nutrient for the welfare of our bodies, it can be detrimental to our health, if allowed to rise to a higher than normal level. It is important that one is aware of our cholesterol levels, risk factors, and ways to lower its level in order to minimize the significant health risks.

Side Effects of Chemical Ingredients in Foods

Presenter: Janna Pierre
Faculty Mentor: Dr. Dominic Hull
Department of Chemistry

Abstract:

Food chemistry and the chemical ingredients placed in our foods will be discussed. The side effects of common chemical additives will be presented along with their possible side effects. For example, citric acid is an organic acid found in many fruits and juices. It increases the acidity of the product making it difficult for bacteria and mold to survive. Some common side effects of over dosage of citric acid are stomach cramps or pain, diarrhea, nausea or vomiting, loss of appetite, increased sweating and swelling, and pain in the abdominal or stomach area. This presentation will focus on the side effects of chemical additives, like citric acid, on the human.
Catalyzed Reactions: Elephant Toothpaste

Presenter: Oluseyanu Omotoso  
Faculty Mentor: Dr. Dominic Hull  
Department of Chemistry

Abstract:

One of people’s favorite things about chemistry is experimental activities. One such activity is called “Elephant Toothpaste”. The two solutions are mixed up together to form a foam like stream similar to toothpaste. The “Elephant Toothpaste” reactions belong to a large class of chemical reactions known as catalyzed reactions. Catalysts serve to speed up chemical reactions by lowering the activation energy barrier. The evolution of oxygen gas is observed by the normal decomposition of hydrogen peroxide

\[ 2 \text{H}_2\text{O}_2 \text{(aq)} \rightarrow 2 \text{H}_2\text{O} \text{(l)} + \text{O}_2 \text{(g)} + \text{heat}\]

This reaction can be catalyzed by adding the iodide anion. The decomposition of hydrogen peroxide in the presence of iodide ion goes in two steps

- \[ \text{H}_2\text{O}_2 \text{(aq)} + \text{I}^- \text{(aq)} \rightarrow \text{H}_2\text{O} \text{(l)} + \text{OI}^- \text{(aq)} \]
- \[ \text{H}_2\text{O}_2 \text{(aq)} + \text{OI}^- \text{(aq)} \rightarrow \text{H}_2\text{O} \text{(l)} + \text{O}_2 \text{(g)} + \text{I}^- \text{(aq)} \]

Combining of these two equations results in what is called the elephant toothpaste. Iodide is acting as the catalyst as it increases the rate of oxygen gas production.

Embracing a Plant-Based Diet to Ward off Chronic Diseases

Presenter: Karuna Rai  
Faculty Mentor: Dr. Dominic Hull  
Department of Chemistry

Abstract:

We are facing a health crisis; no less than 40% of Americans are obese, 50% of us are taking some form of prescription drug, and we spend more than two trillion dollars on health care today- over five times more than the defense budget. And as described by the CDC, chronic diseases are the leading causes of death and disability in America today. Studies have shown that a whole-food, plant-based diet, choosing a diet heavy in fruits and vegetables will help us ward off heart disease, cancer, high blood pressure and obesity. Fruits and vegetables are rich in water, minerals, carbohydrates, natural acids and vitamins. For example, most of whole grains, legumes, nuts, seeds, and all fruits and vegetables contain high amounts of potassium and vitamin B6. Meat and most animal foods contain little to no potassium and actually raise blood pressure and cholesterol. Weight loss naturally occurs when one consumes more fiber, vitamins, and minerals than animal fats and proteins. Hereby, the various chemical compositions of fruits and vegetables with each of their benefits in fighting the chronic diseases will be discussed.
Advantages and Disadvantages of Solar Panels
Presenter: Denzil Rodriguez  
Faculty Mentor: Dr. Dominic Hull  
Department of Chemistry

Abstract:

This study was conducted to determine how Solar Panels work and what are their advantages and disadvantages. Solar panels take in sunlight to create energy or electricity. Some advantages are that they do not use fossil fuels and are renewable energy source. By using renewable energy, one reduces the impact energy needs have on the environment as compared to non-renewable energy. Some disadvantages are that solar panels do not work everywhere. They have to be placed in the right position and at the right angle to effectively use the solar panel. This problem can be prevented by using the correct angle for the set-up of the solar panels.

Pheromones
Presenter: Sandy Yeung  
Faculty Mentor: Dr. Dominic Hull  
Department of Chemistry

Abstract:

Pheromones are airborne chemical messengers produced by the body that are influential to behaviors of receiving individuals. This contributes to human olfaction and the resulting interpretation of these chemicals by the brain. There have been tests that show specific areas of the brain activated by different chemicals smelled by test subjects. Pheromones play a major role in human attraction and can explain why some human behaviors are gender specific. This can also pave the way for pharmaceutical companies in finding chemicals that can relieve symptoms of cancer patients, decrease symptoms of anxiety disorders or pre-menstrual syndrome and be of therapeutic value. Here, I will discuss recent studies and the significance of pheromones in humans.
Catalytic Converters
Presenter: Sheldon Smikle
Faculty Mentor: Dr. Dominic Hull
Department of Chemistry

Abstract:

The first catalytic converter was developed around 1950. It was invented by the French engineer Eugene Houdry. Catalytic converters started to spread in 1975, when regulations restricting air pollution produced by automobiles were introduced. A catalytic converter is a car pollution control that converts toxic pollutants from gas exhaust to fewer pollutants. They are used in cars that use gasoline and diesel and are important because they reduce carbon monoxide, nitrogen oxides and hydrocarbon emissions. Catalytic converters contain precious metals like platinum, palladium and rhodium that act as catalysts to lower the formation of polluting compounds and breathing safer while improving the car life span in addition to the fuel economy.
The Harbor Survey Program of New York City’s Division of Environmental Protection: Its Parameters that Ensure the City’s Waterways

**Presenter:** Maria Anaya, Catherine Carti  
**Faculty Mentors:** Dr. Paris Svoronos, Ms. Faye Jacques, Dr. Panayiotis Meleties  
**Department of Chemistry**

**Abstract:**

The Harbor Survey Program of New York City’s Division of Environmental Agency (NYC-DEP) has evolved to monitor and protect the ecology and vitality of the city waterways. The annual New York Harbor Quality Report involves four different divisions and monitors four water quality parameters: fecal coliform, bacteria, dissolved oxygen, chlorophyll “a” and Secchi transparency. Fecal coliform, a collection of bacteria mainly found in human and animal intestines are linked with sewage waste. Chlorophyll ‘a’ found in phytoplankton is used as an indicator of primary productivity of the food chain. Dissolved Oxygen (DO) levels in water are critical for the respiration of aquatic life forms. The Secci disk estimates the clarity of the surface water via its transparency measurement. A detailed description and case studies will be presented.

Determination of the Ionization Constant of Carboxylic Acid at 0oC Using Microscale Freezing Point Depression Measurements

**Presenter:** Udya Dewanamuni  
**Faculty Mentors:** Dr. Paris Svoronos, Mr. Pedro Irigoyen  
**Department of Chemistry**

**Abstract:**

Freezing point depression is a colligative property that is related only to the number of particles in solution but not to the nature of the solute. For the first time the ionization constant of a carboxylic acid (K_a=10^{-1} – 10^{-3}) is determined in a non-traditional titrimetric method. The values obtained are also the first ones ever recorded at 0oC. The project uses freezing point depression measurements to calculate this physical property using the Van’t Hoff factor. The investigation involves the study of five different carboxylic acids, maleic, malonic, oxalic, chloroacetic and dichloroacetic acids. The ionized fraction of the solute is measured through a derived equation that correlates the freezing point depression temperature. The measured Ka values of various carboxylic acids were determined at various aqueous concentrations (1.00M, 0.50M, 0.25M, 0.10M). The experiment is fast, uses extremely low concentrations of the solute and the results are easily reproducible.
Determining Antioxidant Quantities Present In Commercially Available Beverages via the Folin Ciocalteau Microspectrophotometric Analysis

Presenters: Julie Leong, Daysi Proano
Faculty Mentors: Dr. Soraya Svoronos, Dr. Paris Svoronos
Department of Chemistry

Abstract:

Antioxidants are nutrients whose mission is to quench the formation of cell impairment by neutralizing free radicals in our bodies. They are found in various fruits, vegetables, plants and juice beverages and perform a role in the prevention of several illnesses and potential acceleration delay of the aging process. Free radicals are electron deficient species that fulfill their octet by seeking an electron from neighboring atoms. Antioxidants come into play by donating electrons to satisfy this process thus avoiding the possibility of cell damage. The wine industry uses the Gallic Acid Equivalent method to determine the total amount of antioxidants present in an aliquot. The technique uses the Folin Ciocalteau method whereby a phosphomolybdate/phosphotungstate complex oxidizes gallic acid, which is used as a reference, into the corresponding quinone. The preparation of a standardized gallic acid calibration curve allows the microspectrophotometric (visible light) determination of the total amount of antioxidants present in any sample. The data obtained for various types and brands of juice beverages will be presented and the gallic acid decomposition with time will be evaluated.
Determination of Gallic Acid in Tea Beverages Using High Performance Liquid Chromatography

Presenter: Daysi Proano
Faculty Mentors: Dr. Soraya Svoronos, Dr. Paris Svoronos, Mr. Andrew Xu
Department of Chemistry

Abstract:

Tea bags and juice beverages are drinks that contain phenolics in addition to natural flavors. Phenolics have potent antioxidant properties that can help prevent diseases that are related to oxidative stress. Gallic acid is the antioxidant standard used in the winery industry and has the ability to quench radicals by providing the electron(s) they are missing, thus converting them into species that obey the octet rule. In this project a method has been developed that determines the quantitative measurement of gallic acid by High Performance Liquid Chromatography (HPLC). The liquid sample is loaded into the injector and pushed through the pump into the mobile phase. The different components present in the sample are separated via the column and directed to the detector and finally the recorder. The quantity of each of the eluted components is calculated by measuring the area under the peak. The quantitative measurement of gallic acid in various beverages and tea bags will be presented and compared. The degree of gallic acid decomposition with time is measured after the same samples are allowed to be air oxidized for a whole week.

OXIDATION OF METHYLATED 3H-1-BENZAZEPINES

Presenters: Eun Jung Shin, Yelissa Sosa
Faculty Mentors: Dr. Gopal Subramaniam, Dr. Sanjai Kumar
Queens College, Department of Chemistry and Biochemistry

Abstract:

There are several biologically active molecules containing the 1-benzazepine group. This molecule is relatively flat and is capable of exhibiting atropisomerism when certain substituents are added. In certain cases, atropisomerism has been implicated for their biological activity. Our laboratory is interested in developing small molecule inhibitors of YopH enzyme, a virulent factor for a deadly pathogen. We will utilize 2,4-diaryl-3H-1-benzazepines as a pharmacophore and develop a library of compounds containing this ring system. First, methylated 3H-1-benzazepines will be converted to the corresponding carboxylic acids. This will then be condensed with a library of diverse amines to generate the YopH inhibitory library. In this presentation, the chemical synthesis and characterization of planned inhibitory library is discussed.
Free Cyanide: Understanding Sampling, Preservation and Analysis by Gas Diffusion Separation by the New York City-Division of Environmental Protection (NYC-DEP)

Presenter: Silvia Salamone
Faculty Mentors: Ms. Carmenn Ooi, Mr. Jorge Vilacis, Ms. Faye Jacques, Dr. Panayiotis Meleties, Dr. Paris Svoronos
Department of Chemistry

Abstract:

Regulations have been established to require the monitoring of cyanide in industries, domestic wastes and surface waters. In January 2014 The New York State Department of Environmental Conservation (NYSDEC) added a requirement for "Free Cyanide" as part of the BTW's State Pollutant Discharge Elimination permit (SPDES). In sampling free cyanide both the analytical and the sample preservation procedure recommend the use of sodium arsenite to mitigate the effects of oxidizing agents in effluent samples. Free cyanide sampling is conducted monthly by the New York City Division of Environmental Protection (NYC-DEP) in every single one of the 14 Wastewater Treatment Plants (WTPs). The procedure requires immediate sample preservation at pH>10 after pre-testing for chlorine, sulfide as well as securing a daily pH adjustment. The laboratory procedure distinguishes between free cyanide, for which a gas diffusion separation technique is used, and total cyanide, which involves calorimetric detection. The NYC-DEP has recently switched to the free cyanide sampling system, while the total cyanide sampling system is still being used in monitoring commercial wastewater samples by the IPP Survey Sampling Section. Examples of these procedures in case studies will be presented.
The Application of QuEChERS in the Analysis of Pesticides in Imported Food: An FDA Internship Experience

Presenter: Brian Um
Faculty Mentors: Mr. Keeshan Williams, Mr. Michael Iorsch, Dr. Paris Svoronos
Department of Chemistry

Abstract:

The Food and Drug Administration (FDA) is charged with enforcing pesticide tolerance limits in food as directed by the Food Safety and Inspection Service (FSIS) of the US Department of Agriculture. Early methods for determining pesticide residues involved classical elemental analysis techniques such as spectrophotometric and biochemical methods. During the 1950s chromatographic methods were employed, with greater sensitivity and the capability of identifying residues within a given class. Lahotay and Anastassiades (2003) introduced QuEChERS, a new approach to the extraction of pesticides from fresh fruits and vegetables. This method entails extraction with acetonitrile, partitioning with a salt mixture followed by a dispersive solid phase extraction (dispersive SPE) cleanup with primary-secondary amine sample prep easy (PSA SPE) sorbent. The application of this procedure and adopted modifications of the original procedure to circumvent difficulties will be presented. Sample testing results will also be highlighted.

The Determination of Pesticides in Fruits, Vegetables and Grains via the Luke Method

Presenter: Irene Sun
Faculty Mentors: Dr. Keeshan Williams¹, Mr. Michael Iorsh¹, Dr. Paris D. Svoronos
¹Food and Drug Administration, Jamaica, NY

Department of Chemistry

Abstract:

The classic procedural methods used to determine residual pesticide levels in food generally tend to be labor intensive, require significant volumes of organic solvents and result in the production of large quantities of hazardous waste. The Luke method that was introduced in 1981 uses an extraction procedure that is performed three times for maximum pesticide recovery. Minimal amount of solvents are used with low production levels of hazardous waste. The method is comprised of two groups – Section 302 and C6: SAX/PSA Cartridge Cleanup. Section 302 involves extraction with acetone, liquid-liquid partitioning with petroleum ether and dichloromethane solvents. C6 provides improved cleanup required for data analysis and recovery on polar and nonpolar residues. Lastly, mass spectrometry reveals the structures of all the pesticides present in the food in question (analyte). The data from mass spectrometry will be cross-referenced with pesticide tolerance levels set forth by the U.S. Environmental Protection Agency (EPA) to determine whether or not a particular food, local or imported, is safe to consume by the American people. Application of this method in case studies will be presented.
Wastewater Treatment System as Administered by the Water Pollution Plants at the New York City-Division of Environmental Protection

Presenter: Melody To

Faculty Mentors: Ms. Faye Jacques, Ms. Abeba Negatu, Mr. Panayiotis Meleties, Dr. Paris Svoronos

Department of Chemistry

Abstract:

Every day 1.3 billion gallons of influent wastewater enters New York City’s Department of Environmental Protection’s (NYC-DEP) 14 different treatment plants before they are converted into effluent water and released back into rivers, reservoirs, tributaries, and the ocean. The sources of this wastewater are industrial, commercial, residential, and storm/rain. About fifty years ago, the harbor water started becoming heavily polluted and problematic along the shorelines of New Jersey and New York states. In 1978, the Clean Water Act was instilled to fix this issue in order to protect civilians from the highly concentrated, aqueous chemical contamination by requiring a permit from any industrial or commercial facility before releasing wastewater. This permit adheres to the official, chemical standards for pollutants such as cyanide, nitrate and heavy metals. This Clean Water Act also began the Harbor Survey Program, where 19 different locations along the NYC coast are sampled before being delivered to the Wastewater Control Plant Laboratories for processing. This analysis is done to reflect the effectiveness of pollutant and waste removal during the NYC’s wastewater treatment system which undergoes five major processes: preliminary treatment, primary treatment, secondary treatment, disinfection, and lastly, sludge treatment. The methods that dispose of the pollutants, handle byproducts, and clean the contaminated water for the safety of New York City residents will be presented and analyzed.
ArcGis: Understanding Citywide Infrastructural Landscape

Presenter: Brian Um
Faculty Mentors: Ms. Faye Jacques, Ms. Jose Vilacis, Mr. Panayiotis Meleties, Dr. Paris Svoronos
Department of Chemistry

Abstract:

The Shoreline Survey Unit in the Compliance Monitoring Section (CMS) of the New York City-­‐‑Division of Environmental Protection (NYC-­‐‑DEP) provides the Shoreline Survey Operational Plan for implementation of the mandated State Pollution Discharge Elimination System (SPDES). Since 1991 this plan covers the following drainage basin areas: 26th Ward, Bowery Bay, Coney Island, Hunts Point, Jamaica, Newtown Creek, North River, Oakwood Beach, Owls Head, Port Richmond, Red Hook, Rockaway, Tallman Island, and Wards Island. The survey of these basin areas resulted in the identification of 3,429 outfalls. These outfalls include 337 combined sewer overflow, 1,977 direct discharge, 118 general, 803 highway, 152 storm and 42 SPDES permitted outfalls. Once the source of an illegal discharge is identified, a lengthy investigation follows with a two-phase abatement schedule that must be submitted within 30 days. The first phase indicates a timetable for the completion of the investigation in determining the source(s) of the discharge. The second phase is submitted upon the identification of the source(s) and reflects a schedule for the ultimate abatement. By identifying, updating and rectifying the sewer, sanitary, and combined connections, the Department of Environmental Protection-­‐‑Compliance Monitoring Section (DEP-­‐‑CMS) uses a proprietary mapping system (ArcGis) that enhances communication and management of the physical locations. In addition ArcGis classifies the outfall size to the citywide officials for emergency and day-to-day operational management. Details for each individual process will be presented.
Sensitivity of Double Mutant rad4rad5 Yeast Cells to DNA Interstrand Crosslinking

**Presenter:** Mengjia (Michelle) Lin  
**Faculty Mentor:** Dr. Wilma Saffran  
**Department of Chemistry and Biochemistry Queens College of the City University of New York**

The treatment of DNA with psoralen and ultraviolet light leads to interstrand crosslinks (ICLs) that covalently link two individual strands of DNA. This treatment prevents replication and transcription and causes cell cytotoxicity. Several repair pathways act on ICLs in yeast. The nucleotide excision repair (NER) pathway repairs damaged DNA by removing the modified nucleotides and filling in the resulting gap. The post-replication repair (PRR) pathway does not remove the damage, but allows the cell to tolerate the lesion and resume replication. Homologous recombination (HR) is a major pathway for ICL repairs, but may result in rearrangements. We used a direct repeat to study ICL-induced recombination in yeast, measuring conservative HR events leading to gene conversion, or non-conservative events resulting in deletions or crossovers (scored as gene triplications). RAD4 is a nucleotide excision repair gene, while RAD5 is a post-replication repair gene. Loss of either RAD4 or RAD5 function increases cell sensitivity to ICLs and reduces genome stability. The focus of this study is to see if a double mutation of RAD4 and RAD5 will further impact cell sensitivity. Survival studies show that the rad4rad5 double mutant is more sensitive to psoralen-induced ICLs than repair proficient cells it is only slightly more sensitive than the single mutant rad4 or rad5 strains. The rad4rad5 deficient cells also have a higher level of recombination compared to the repair proficient cells or either of the single mutants. The fraction of deletions in the rad4rad5 double mutant was higher than that of the rad4 mutant, but these levels were about the same in comparison to the rad5 mutant. In the repair proficient cells and in the rad5 single mutant, the major products of recombination were gene conversions. In comparison, the rad4 single mutant had approximately equal levels of gene conversions and triplications, and most of the recombination products in the rad4 rad5 double mutant were triplications. In conclusion, functioning NER (RAD4) and PRR (RAD5) pathways are required for maintenance of genomic stability, and loss of both pathways further increases the extent of gene copy number changes induced by ICLs.
My Favorite City
Presenter: Bryan Chetram
Faculty Mentor: Dr. Wei Lai
Department of Foreign Languages & Literatures

Abstract:

My presentation will be a demonstration of my knowledge of the Mandarin language throughout a PowerPoint presentation of my favorite city: the culture of the city and its uniqueness. The PowerPoint presentation will also present my understanding of proper grammatical and structure use of the Mandarin language including tone through my individual presentation. Additionally I will present a brief summary about my favorite city to also show my understanding how to use the Mandarin language from a literature perspective.

A Day in the Life of a Rising Politician
Presenter: Kyle Chin-How
Faculty Mentor: Dr. Jenny Lin
Department of Foreign Languages & Literatures

Abstract:

I will use PowerPoint slides in this presentation to illustrate my composition “A Day in the Life of a Rising Politician,” written in Chinese. I will talk about myself which will include my birthday, where I was born and raised, my current place of residence, daily routine, hobbies/interests, school [class load], career plan [in politics], experience in learning Chinese, how I find it comparatively and how I believe it will bolster my political agenda. I will also talk about my family members, my mixed heritage and our favorite cuisines. I will conduct the presentation in Chinese and it will last approximately 5 minutes.

I will use the linguistic knowledge learned in the class, which includes writing Chinese characters, grammar, vocabulary, and sentence structures, for this presentation. And I have begun preparing this under the tutelage of Dr. Jenny Lin.
My Favorite City
Presenter: Justin Lee
Faculty Mentor: Dr. Wei Lai
Department of Foreign Languages & Literatures

Abstract:

I will use PowerPoint slides in this presentation to illustrate my composition “My Favorite City,” written in Chinese. I will talk about myself, which will include talking about the weather, food, and culture compared to New York. Also, I would like to go there one day with family or friends because I have never been there. I will conduct the presentation in Chinese, and it will last approximately 5 minutes.

My Life
Presenter: Robin Li
Faculty Mentor: Dr. Jenny Lin
Department of Foreign Languages & Literatures

Abstract:

In my presentation, I will be using PowerPoint slides to illustrate my composition “My Life.” I will discuss things about myself, which will include my birthday, my daily routine, how many classes I have this semester, my experience learning Chinese and the different languages I speak. I will also be discussing my family members, including information such as nationalities, their professions and some of their favorite cuisines. I will conduct the presentation in Chinese and it will last approximately 5 minutes.

I will use the linguistic knowledge learned in my Chinese class, which includes writing Chinese characters, grammar, vocabulary, and sentence structures, for this presentation.”

My Life
Presenter: Jeovanni Nembhard
Faculty Mentor: Dr. Jenny Lin
Department of Foreign Languages & Literatures

Abstract:

In my presentation, I will depict my written composition entitled “My Life.” I will discuss various things about myself, including my family members, their interests and profession, my daily routine, my hobbies, different languages I speak, and, most importantly, my school life here at QCC. I will use all the linguistic skills I have acquired in Chinese, including the correct use of Chinese characters, grammar, sentence structure and vocabulary. My presentation in Chinese will last about 5 minutes.
My Life
Presenter: Bessie O'Campo
Faculty Mentor: Dr. Jenny Lin
Department of Foreign Languages & Literatures

Abstract:

I will conduct a presentation with PowerPoint slides with the support of videos and images. I will start by briefly introducing myself. I will state my name in English and in Chinese. I will include information such as my age, birthday, occupation, nationality, the languages I speak and show the island I am from. I will then discuss my family members, their occupations and their hobbies. After that, I will talk about my favorite cuisines and what I like to do in my free time. Finally, I will talk about my school life.

I will use the linguistic knowledge I have learned in Chinese, including Chinese characters, grammar, vocabulary and sentence structure for the presentation.

My Life
Presenter: Michael Ramsey
Faculty Mentor: Dr. Jenny Lin
Department of Foreign Language and Literatures

Abstract:

I will be using PowerPoint slides to present my composition titled "My Life." I will be talking about myself, including my Chinese name, my birthday, my day-to-day activities, my school, how many classes I am taking, my Chinese learning experience, and how many languages I speak. Aside from myself, my family members will also be mentioned. Information about them includes their backgrounds, where they work, and their favorite food. I will use the Chinese characters and all the grammar skills I have learned. My presentation will last 5 minutes.

My Life in Chinese
Presenter: Moe Thet San
Faculty Mentor: Dr. Jenny Lin
Department of Foreign Languages & Literatures

Abstract:

I will be presenting my composition of "My Life" with the aid of a PowerPoint presentation to illustrate the main points of my composition. The presentation will include my birthday, where I work, my school, the classes I am taking, and my daily routine. I will also talk about my experience learning Chinese and the languages I can speak. In addition, I will talk about my family members and tell some fun facts about them. The presentation will be done in Chinese and will last around 5 minutes. I will use the linguistic knowledge I have learned in Chinese, including Chinese characters, grammar, vocabulary and sentence structure for the presentation.
My Life
Presenter: Woiser Youdon
Faculty Mentor: Dr. Jenny Lin
Department: Foreign Languages and Literatures

Abstract:

I will be using power point to illustrate my composition titled “My Life.” In this presentation I will be talking about myself, my family members, my friends and my school life. It will be conducted in Chinese. I will start off with an introduction of myself and my background, such as my name, my nationality, my age, etc. Then I will talk about my family members and their professions. Afterwards I will talk about my hobbies. Next, I will talk about my school life at QCC and, in particular, about my Chinese class--what I struggle with and what I enjoy in that class. I will talk about my professor and my classmates. Finally I will conclude by describing my experience as a whole for this year. My presentation will take about 5 minutes.

My Life
Presenter: Winnie Yu
Faculty Mentor: Dr. Jenny Lin
Department of Foreign Languages & Literatures

Abstract:

I will use PowerPoint slides in this presentation to illustrate my composition “My Life,” written in Chinese. In my introduction, I will talk about myself, which will include my birthday, my nationality, my family, and our favorite cuisines. Then I will discuss my daily routine, how many classes I have this semester, my experience learning Chinese and how many languages I can speak. Towards the end of the presentation, I will also include what I do in my leisure time, my hobbies, and my classmates. This presentation will last approximately 5 minutes.
Scattered Minds
Presenter: Jonathan Cajas
Faculty Mentor: Dr. Jan Ramjerdi
Department of English

Abstract:
This presentation is a reading of my story “Scattered Minds” set in New York in 2025. Alex, an artistic high school senior completely oblivious to all people around him, just doesn't seem to fit in with society. In the city of 2025, there are speakers on every third block announcing different subject matters such as math, science, and politics, subdivided into topics with each area. People use this information in their studies and careers. Alex, who has ADHD, has a tough time listening to these loudspeakers because he is always thinking about other matters in his life, his views are completely different from those he hears, and people look down on him. This story is about his struggle to become an artist in a society that demands he conform in order to succeed.

I’m Sorry Baby
Presenter: Amanda Cox
Faculty Mentor: Dr. Jan Ramjerdi
Department of English

Abstract:
This presentation is a reading of my story “I’m Sorry Baby”. The story is an excerpt from the novel I am working on, The Way I Loved You, an autobiography-based stylized story about a girl who struggles with finding her identity after years of ignoring her own needs. This involves losing the guy she loves. Mixed feelings arise when she’s adamant about maintaining a friendship with him, despite her romantic feelings towards him. Her efforts become hampered by the sexual relationship they carry on with, despite the pain it causes her. She is faced with the dilemma of finding where he stands in her life, if he has a place in her life at all. “I’m Sorry Baby” was published in December 2014 in East Fork, the Claremont College/University of California literary magazine.
The Dangers of Fixation in Nabokov’s Lolita and Harris's Silence of the Lambs

Presenter: Monica Hernandez
Faculty Mentor: Dr. Beth Counihan
Department of English

Abstract:

This paper explores the notion of fixation—having a deeply rooted attachment to a person, object or idea—in both Vladimir Nabokov’s controversial novel Lolita and Thomas Harris's psychological thriller The Silence of the Lambs. The relationship that blooms from Humbert and Dolores Haze parallels that of Hannibal Lecter and Clarice Starling.

Through a series of developmental stages, these two couples transcend the original state of their being together and blossoms into a grotesque version of a father daughter relationship. Infatuation leads to more, and thus a metamorphosis ensues. What came from the chrysalis was a deformed obsession which will be analyzed through comparisons of the two works of Nabakov and Harris, respectively.

Depictions of Hubris in the Ancient Greek Tragedies Medea and Oedipus Rex

Presenter: Aaron Jeon
Faculty Mentor: Dr. Robin R. Ford
Department of English

Abstract:

It is over two-thousand years since Sophocles and Euripides wrote dramas examining the human condition. Why are we still fascinated with these plays and characters today, and what can be applied to today’s modern world. This research looks specifically at the role hubris plays in the development of characters in Medea and Oedipus Rex. It will discuss how the strength of pride can become the fatal flaw of hubris. Making this research contemporary, it will connect these ancient portrayals to current popular culture characters. From Anakin Skywalker (aka Darth Vader) of Star Wars to The Dark Knight’s Harvey Dent to Flynn’s Gone Girl, pop culture is full of characters whose excessive pride causes them to act in ways which eventually lead to their downfall or death.
**Brotherly Love**
**Presenter:** Donald Jean-Pierre
**Faculty Mentor:** Dr. Jan Ramjerdi
**Department of English**

**Abstract:**

This presentation is a reading of my story, “Brotherly Love”. This story of two brothers living in Brooklyn is told in a series of scenes which reveal the ups and downs of their relationship, their daily lives, their secrets, their relationship with their father, and events from the past. Despite the harsh language and the attitude between the two, they absolutely love each other.

**Exploring My Cultural Heritage: An Analysis through Amy Tan’s “A Pair of Tickets,” John Updike’s “A&P” and Pat Mora’s “Immigrants.”**
**Presenter:** Stephen Seubarran
**Faculty Mentor:** Dr. Tanya Zhelezcheva
**Department of English**

**Abstract:**

*Examining Guyana, a cultural heritage site, is significant to me. Analyzing Tan’s “A Pair of Tickets,” Updike’s “A&P,” and Mora’s “Immigrants” through close reading, digital humanities tools like textual visualizations, and additional research, I found questions which they raise. I applied these questions to my cultural heritage site in order to understand it better. Tan’s story allowed me to see the importance of Guyana to myself, while Updike’s story provoked my thinking of how my ancestors found the courage to achieve independence. Mora’s poem made me appreciate that even though I am American, I can appreciate my Guyanese cultural heritage. Before analyzing my heritage site through the viewpoints of these literary works, I did not assign much value to it. However, after this analysis I appreciate my cultural heritage more.*
The Way of Living: Examine Qingyang Temple through the Literary Works: John Updike’s “A & P” / Anton Chekov’s “The Lady with the Dog”

Presenter: Yi Jiang
Faculty Mentor: Dr. Tanya Zhelezcheva
Department of English

Abstract:

Examining Qingyang temple, a cultural heritage site, through John Updike’s “A & P” and Anton Chekhov’s “The Lady with the Dog” amazing inner connection between Taoism and modern western life is discovered, which reveals that Tao provides solutions for human sufferings regardless of time and space.

Both literary works reveal sufferings of human beings. Tao, which is the cultural heritage represented by Qingyang temple, points out the way to dissolve such sufferings. Reading these literary works allows me to think deeper about Tao and the solution “Wu-wei” (non-action) it provides, and discover the inner connection between ancient Chinese wisdom and modern western people. Before reading the literary works, Qingyang temple was only a historical site to me, but after reading the literary works closely and analyzing them through the use of digital humanities tools, I obtained a more profound understanding towards Chinese culture as well as human nature.
There Is Love Here
Presenter: Brittany Kaliscik
Faculty Mentor: Dr. Jan Ramjerdi
Department of English

Abstract:

This presentation is a reading of the beginning of my novella in progress entitled “There is Love Here”, about the complex effects alcoholism has on a family. The narrator is a young woman whose relationship with her alcoholic mother is both terrifying and loving at the same time. The story is told in a series of scenes, moving back and forth in time, which show their relationship—the good and the bad—at different moments in their lives. The scenes also show the effects of the mother’s unpredictable and abusive behavior on the family. The opening section I will read follows the main character and her dysfunctional family on Thanksgiving.

The Negative Impacts of Bullying on Different Types of College Students:
A Look into Students Who Are of Various Sexual Orientations As Well As Students with Disabilities and Learners of English as a Second Language
Presenter: Anita Yip
Faculty Mentor: Professor Lauren Hersh
Department of English

Abstract:

In my thesis, the objectives of an assortment of bullying and discrimination will be discussed in detail. With focus on the university level, the essay looks at bullying in regards to students with disabilities, LGTBQ students, as well as students who are English as Second Language learners. While one may not see its importance, it is in actuality quite prevalent among colleges and universities worldwide, including our own. Bullying and discrimination affects college students – the ones who study and work diligently to pursue the future they have envisioned for themselves – in ways that restrain them from their goal and in some cases, result in death. By utilizing source materials from credible databases as well as statistics from self-conducted research, a supported claim, outcome, and preventative measures will be proposed in a well-organized fashion. A visual that depicts all of which is stated above will be also presented.
A Twisted Fate

Presenter: Zhao Lin
Faculty Mentor: Dr. Jan Ramjerdi
Department of English

Abstract:

This presentation is a reading from my novella in progress, “A Twisted Fate”, which tells the story of a member of the Japanese mafia, Yamaguchi-gumi. As a boy he lived in rural Japan and lost his father and mother at age eight. He was sent to a home for children in Tokyo where his life completely changed. In the new environment, he tried to hide his emotions from his classmates and friends. His personality became negative and twisted, causing him to go astray. At 18, he joined the notorious Yamaguchi-gumi gang. Violence and drugs were part of his everyday life, causing him to struggle and become numb. He lost all hope in life and wandered without goals until the day he was saved by a woman. He opened his frozen heart and reversed his twisted fate. Because of her, he regained hope and started a new life in Singapore.
The Marathon Journey: An Autobiographical Case Study of a Visually Impaired Student’s Journey from Immigrant Household towards Self-Actualization

Presenter:  Asim Baig  
Faculty Mentor:  Dr. Anita Cuttita Ferdenzi  
Department of Social Sciences

Abstract:

The purpose of this research project is to present an autobiographical case study chronicling the author’s experiences as a visually impaired immigrant student in the United States special education system. This researcher describes the evolving perceptions of individuals with disabilities in the United States and his native country of Pakistan. The development of special education programs are discussed with a focus on the legislative safeguards contained in the Individuals with Disabilities Education Act. Gaps between the intended goals and actual implementation of these safeguards in the researcher’s special education program are identified. The author employs social science theory to underscore the impact of these experiences on his cognitive, physical, social and emotional development. The author demonstrates the key role that service agencies for the blind and volunteer organizations such as Achilles International play in promoting his self-efficacy and setting of his career goals.

Employing and Promoting Healthier Food and Snack Options for the Vending Machines on the QCC Campus

Presenter:  Bayard Carmiencke  
Faculty Mentor:  Dr. Lana Zinger  
Department of Health, Physical Education and Dance

Abstract:

This study assessed the nutrient density of snacks sold in vending machines at QCC. Utilizing a qualitative approach, the student surveys found that students requested affordable, accessible and healthy snacks in the vending machines. The nutritional analysis showed that the vending machines contained high calorie, high sugar, high sodium and poor nutritional quality snacks. An advocacy campaign was created to change the vending machine snacks on campus.
How do Social Constructions of Gender Impact the Global Self-Esteem of Women across the Life Course?

Presenter: Tatiana Espinoza
Faculty Mentor: Dr. Amy Traver
Department of Social Sciences

Abstract:

This presentation will examine how gendered social statuses/roles impact the global self-esteem of women across the life course in the United States. The data used in this presentation will be collected via semi-structured interviews with 5 women from a range of age categories: 10-20; 20-30; 20-40; 40-50; and 50-60. Interviewees will be asked about their understanding of gendered social statuses/roles for women in their age category, and how these statuses/roles affect how and what they think about themselves. Data gathered will be analyzed via a process of open coding and connected to contemporary theory in the fields of both sociology and psychology.

The Effects of Nondisabled American Girls’ Volunteer Participation in a Dance Program for Girls with Disabilities

Presenter: Jay Lucero
Faculty Mentor: Dr. Amy Traver
Department of Social Sciences

Abstract:

This research is part of a larger project that examines how nondisabled American girls are impacted by their volunteer participation in a dance program for girls with disabilities. The project data was collected using a pre/post-service survey administered to 73 volunteers over a three-year period (2009-2012). This poster will examine one realm of the project’s findings: the relationships between girls’ carework, emerging sense of responsibility to others, embodiment, and civic engagement. Preliminary analyses reveal how volunteers’ carework required their physical presence and revealed the concrete difference they made in the lives of dancers; in turn, this carework also led to volunteers’ development of confidence and socio-political awareness. These findings exhibit the productive results of civic engagement in the lives of American girls, and contribute to the disability studies, girls’ studies, and civic engagement literatures in sociology.
Yes, Even the Slightest Generalization is still a Prejudice

Presenter: Insoo Cho
Faculty Mentor: Dr. James Nichols
Department of History

Abstract:

Most of us are well aware of the unrighteousness of prejudice and discrimination. However, many still consistently judge and make presumptions without possessing adequate evidence nor the relevant facts but rather base it on their own logic and experience; this failure to acknowledge those preconceived ideas are also a form of prejudice and discrimination and an act of social violence. It is difficult for one to distinguish the difference between a simple misconception and prejudice, and often do not realize its impact on one’s life and, furthermore, the whole society.

As an Asian woman living in America, an ethnic minority, I always thought I had a better stance on understanding the impacts of prejudice, and I prided myself on having a fairly objective view on such matters. However, I was shocked to learn how wrong I was when I was challenged by a book called Recitatif by Toni Morrison during English class. Throughout this book and the class debate, I realized the weight of the term, “objective standard.” Although it is only a short story, this book is a powerful tool to attest to the serious impact of preconceived ideas or misconceptions that impacts not only one’s life but the whole society through the relationship of the two protagonists. The author manages to deeply address the impact of the preconceived ideas on their relationship and the society, influenced by their social backgrounds and historical backgrounds. To help further understand the historical background and the social atmosphere, I have examined newspapers and the book itself that studies the background period of the book. Through this research I would like to attest on how the “objective standard” based on one’s preconceived ideas or misconceptions is also part of prejudice and social violence, and how its impact is larger than one can imagine. Though it seems impossible, with true understanding of the idea that everyone is equal, I would like this study to be a valuable resource in normalizing a completely prejudice-free world.

Capitalism and Beauty Aesthetics

Presenter: Bernadette Schaefer
Mentor: Dr. Elizabeth Wissinger
Borough of Manhattan Community College, Department of Social Sciences & Human Services

Abstract:

This work acknowledges that in American culture, within each decade, there are specific shifts and changes that take place in body image ideals among women. In examining advertisements and images of women, I found these shifts are anything but arbitrary. My survey of images of women since the early 1900’s indicates that changes in beauty aesthetics were a response to our ever changing socioeconomic structure. From this, we can conclude that every time there is a shift, or boost in capitalism as well as the accompanying capitalist ideals, there are significant changes in ideal female beauty aesthetics.
**Hip Hop as Folk Music**

**Presenter:** Lisa Del Sol  
**Faculty Mentor:** Professor Brenda Henry-Offor  
*Brooklyn College, Department Gender Studies*

**Abstract:**

Many scholars have struggled throughout the years to classify hip-hop or rap music as folk music. I believe that hip-hop according to the definition of folk music can and should be identified as folk music.” (Slovenz, 151). Hip-Hop is definitely an art form, and it has so much history embedded within it. In freestyle battles the music is communal, and the audience is included as the judge as they determine who will be the champion, and who needs to work on their rhymes. Hip-Hop is folk music because it is a musical art form that has its roots in the community, and it discusses the struggles of everyday people. This music connects to an audience that can identify with struggles that are expressed within those songs. In this paper, I will examine the sub-genre of trap music and I will explain why it should be defined as folk music.

**Stop and Frisk**

**Presenter:** Latoya Johnson  
**Faculty Mentor:** Professor Brenda Henry-Offor  
*Brooklyn College, Paraprofessional Program*

**Abstract:**

My literature review research paper will examine the extent to which a police officer and a suspect’s race influence the use of force after a stop and frisk has been initiated. In particular, my thesis will focus on why NYPD police officers use force after a stop and frisk is conducted against minority men. The NYPD’s aggressive stop and frisk policy has been a controversial topic often addressed within the media, among the city’s citizens and policy makers for many years. After carefully analyzing the causes and effects of Stop and Frisk, I began to understand that many African American and Latino males have experienced or have been subjected to a great amount of pain and frustration in their lives. In this paper I will examine how minority men are wrongly victimized and racially profiled by law enforcement in New York State. I will also look at the consequences of “stop and frisk” including, victims’ fear of encounters with law enforcement.
**Function of Feste in Twelfth Night**

**Presenter:** Dominique Young  
**Faculty Mentor:** Professor Brenda Henry-Offor  
**Brooklyn College, Paraprofessional Program**

**Abstract:**

Shakespearean comedies each feature a clown that causes confusion and absurdity within the play which makes the plays very comedic. The absurdity of the clown can be exemplified through the way he talks or the way he interacts with other characters in the play. In addition to causing confusion and portraying absurdity, the clown has other functions. In Twelfth Night, Feste the clown plays an important role in the play. He portrays the way his wit overpowers his social status by manipulating words, foreshadowing events, embodying philosophical thinking, and being an entertainer.

In this paper I will use Twelfth Night, to examine the clown, Feste’s role as he uses his wit to overcome his social rank via his ability to manipulate people’s words. I will compare Feste’s role to that of other characters in the play in order to show the comedic effect and connivance of Shakespeare’s clowns.

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**Names and Naming in the Work of Black Women Writers**

**Presenter:** Shayne McGregor  
**Faculty Mentor:** Professor Brenda Henry-Offor  
**Brooklyn College, Department of English**

**Abstract:**

Sigrid King states, “Naming has always been an important issue in the Afro-American tradition because of its link to the exercise of power [...] Afro-Americans have been made aware that those who name also control, and those who are named are subjugated” (King 683). The truthfulness of this statement permeates throughout the black diasporic tradition, particularly the artistic tradition spearheaded by black women. Zora Neale Hurston, Paule Marshall, and Edwidge Danticat, though not an American herself, have all made it a point to indicate the significance of names and, by extension, how their level of authenticity has affected the growth and recovery process for African descended people. This paper views growth as the process by which African descendants reclaim the spaces they have earned due to their participation in the construction of those spaces, or have earned by right of birth. This paper views recovery as the process by which African descendants have reconciled their traumatic past and present with the knowledge that they are more than the culmination of their tragedies. The act of naming, then, is pivotal, but also potentially detrimental, to the convalescence of African descended people in the work of black women writers.
Hansel and Gretel: A Classic Renewed
Presenter: Gabrielle Rios
Faculty Mentor: Valerie Sokolova
Kingsborough Community College, Department of Art

Abstract:

The work of the Grimm Brothers is well documented and many are familiar with the token few that have been given new life at the hands of Disney and other contemporary adaptations in art and animation. However, even more important than cleaned-up versions are those reimaginings that manage to capture the Grimms’ unique blend of atmospheric dread and childish fancy, and nowhere are these traits more prominent than in Hansel and Gretel. In my class, we were tasked with preserving the distinctive mood of a Grimms’ work while renewing the classic story through modern techniques in composition and coloration. At the end, we reviewed the implications and qualities inherent in heroism and centered our works on the “obvious” hero—someone in the story that went above and beyond the call of leadership into heroic endeavor. Simply put, we were renewing a classic.

How Could a Loving God Allow So Much Suffering?
Presenter: Ousmane Ba
Faculty Mentor: Professor Rick Repetti
Kingsborough Community College, Philosophy Department

Abstract:

In recent years, atheists have become more vocal in arguing that the very concept of God is logically incompatible with the existence and extent of evil and imperfection in the world. Their argument has been titled “the argument from evil” (hereafter, the “atheist’s argument”). In this paper I develop a contrary argument, a theodicy: an attempt to explain how the existence of a benevolent God is logically compatible with the existence and extent of evil (hereafter, the “theist’s argument”). I argue that the existence and extent of evil and imperfection in the world does not constitute sufficient evidence against the existence and/or benevolence of the sort of omnipotent, omniscient, supreme being and creator that the major monotheistic Abrahamic religions – Judaism, Christianity, and Islam – refer to, respectively, as Yahweh (or G-d), God, and Allah.
Chai Boys
Presenter: Daniel Ioannou
Faculty Mentor: Dr. Katia Pera
Kingsborough Community College, Department of Sociology

Abstract:

Chai Boys is a former soldier’s firsthand account of his observations he made in Southern Afghanistan from December 2011 through November 2012. Those observations were then connected with various sociological theories that were taught in an Introduction to Sociology class. The main observation noticed was, a young unrelated boy accompanied powerful men. The young boy’s primary role was to serve tea to guests. “Chai Boy” is a nickname that is associated with a young boy who is within that type of relationship. Eventually, it gets revealed that these boys are also used for sexual pleasure. The former soldier was then able to link Hegel’s master-slave dialectic, with the relationship between the Afghan man and the “Chai Boy”. The great importance of utilizing sociological theories to break down the unconventional relationship will aid in the understanding of this practice.

How Christian Values Impact Ethical Issues In the Treatment of Addiction
Presenter: Michael-Todd Hall
Faculty Mentor: Dr. Joan Standora
Borough of Manhattan Community College, Department of Social Sciences & Human Services

Abstract:

Due to the increasing emphasis placed on the relationship between CASACs and ethics, this paper seeks to determine how values-based ethical practices influence perceptions about whether an action is right or wrong according to Christian values. Based on an overview of virtues and servant leadership, Christian values provide a model of virtues that applies resources of the Christian faith as a guide to help decide to do what is ethical in the treatment of addiction. It is the objective of this paper that this proposed virtues framework will distinguish how Christian ethics brings biblical values into ethical issues. It will develop a Christian approach to ethics as applied in the treatment of addiction, but it will not attempt to give answers to major issues in workplace ethics. Instead, it will focus on Christian ethical principles and methods that Christian CASACs can use to apply the principles to issues and cases.
Abstract:

This work acknowledges that in American culture, within each decade, there are specific shifts and changes that take place in body image ideals among women. In examining advertisements and images of women, I found these shifts are anything but arbitrary. My survey of images of women since the early 1900's indicates that changes in beauty aesthetics were a response to our ever changing socioeconomic structure. From this, we can conclude that every time there is a shift, or boost in capitalism as well as the accompanying capitalist ideals, there are significant changes in ideal female beauty aesthetics.
Morphological Characterization of Supragranular Neurons in the Primary Somatosensory Cortex

Presenter: Maria Anaya
Faculty Mentor: Dr. Areti Tsimounis
Department of Biological Sciences and Geology

Abstract:

The cerebral cortex is the outer covering of gray matter over the two hemispheres. It is involved in various functions including motor functions and touch sensation. We are conducting a morphological analysis of supragranular neurons in the barrel cortex of the mouse (S1BF), which receives sensory input from the whiskers. Our purpose is to determine the morphological characteristics that differentiate groups of neurons and whether or not they correspond to particular functions. Acute coronal slices from the S1BF of mice are processed with DiOlistics, which labels neurons with lipophilic dyes. In vivo injections of fluorescent beads in primary motor cortex label the neurons that project from S1BF. Computerized reconstructions of neurons are created, and morphological parameters are measured. Principal component analysis is used to select the parameters that distinguish the morphological classes and cluster analysis determined the final classification. Our final dendrogram shows six morphological classes of neurons.
Effect of Disinfectant Lysol on the Bathroom Counter

Presenter: Alanis Barrientos  
Faculty Mentor: Dr. Raji Subramaniam  
Department of Biological Sciences and Geology

Abstract:

The purpose of this project was to test the effect of disinfectant Lysol on bathroom counter. Swab was taken from the counter before and after cleaning with Lysol. The swab was cultured on to milk plate, EMB plate and S110 plate. The bacteria from the plates were further studied by Gram stain. There was no growth seen in plates cultured with swab from the surface after cleaning with Lysol. This study suggested that Lysol is a good disinfectant to clean the bathroom counter.

Ability of Clorox as Commonly Used Household Cleaning Product

Presenter: Nataly Jara  
Faculty Mentor: Dr. Raji Subramaniam  
Department of Biological Sciences and Geology

Abstract:

The experiment aimed in investigating the effect of a commonly used household cleaning product, Clorox. This product was tested out by observing the bacterial growth of an independent area before the Clorox product was applied. The area used for this study was a kitchen refrigerator handle. This area was chosen since it is one of the most commonly used household surfaces. Clorox was very effective in cleaning the refrigerator handle.

Role of STAT3 in Colon Cancer Epithelial Cell Migration

Presenter: Lance Kong  
Faculty Mentor: Dr. Regina Sullivan, Dr. Andrew Nguyen  
Department of Biological Sciences & Geology

Abstract:

Chronic inflammation is usually an important risk factor that potentially can increase patient susceptibility to colorectal cancer. STAT3, the oncogenic transcription factor of interest, plays a role in inflammation induced tumor progression to malignant stages in colon epithelium. In this project we are interested in how the utilization of various concentrations of the STAT3 inhibitor, 5, 15-diphenylporphyrin (5, 15-DPP), will impact the migration rates of SW620 colon cancer cells. We suspect that introducing such an inhibitor will interfere with cell signaling processes that regulate cancer cell migration. To conduct the experiments, we coupled the usage of scratch assays (wound healing assays) with the Zeiss Inverse Phase Microscope as an easy and efficient method to monitor migratory behaviors.
**Finding our Ancestry Using MtDNA**

**Presenter:** Ted Pierre-Louis  
**Faculty Mentor:** Dr. Sara Danzi Engoron  
**Department of Biological Sciences & Geology**

**Abstract:**

Did you ever wonder where you came from? We can find out with our mtDNA. It is within the mitochondria that we find mtDNA. MtDNA can only be inherited from your mother. After extracting our DNA, we amplify a 440 bp region and have it sequenced the DNA sequence we compared to the mtDNA from pure lineages in the data bank. We hypothesize we will be able to find our ancestry by using mtDNA to trace down where our DNA sequence comes from. The results will be analyzed and will be presented.

![Mitochondrial DNA structure](image)

**Tracing Ancestry with Mitochondrial DNA**

**Presenter:** Mercedes Polanco  
**Faculty Mentor:** Dr. Sara Danzi-Engoron  
**Department of Biological Sciences and Geology**

**Abstract:**

The purpose of this experiment is to challenge the idea of race by showing that phenotypic traits are not reliable indicators of genetic similarity. We extracted DNA from cheek cells and had them sequenced. Using DNA Subway we compared each student’s DNA with sequences in the data bank and other members of the class. The data bank contains sequences from individuals considered of “pure” geographical lineage. We then created a phylogenetic tree that shows the similarities between individuals and suggests ancestral origins. For my own origins (Dominican Republic), comparisons with the other students at QCC suggested I was most closely related to a student from Grenada and was most similar to individuals from several North American Indian tribes in the data bank. Most students found genetic similarities with individuals from unexpected origins supporting our hypothesis.
Testing the Effect of Sani Wipes on a Kitchen Garbage Can

Presenter: Raquel Romaine, Harpreet Singh
Faculty Mentor: Dr. Raji Subramaniam
Department of Biological Sciences and Geology

Abstract:

The objective of this experiment was to test how well Sani Wipes (Isopropyl alcohol) kill different forms of bacteria located on a kitchen garbage lid. Methods used were taking a culture from the lid before and after using Sani Wipes, then smearing the culture on a milk plate and incubating 42 hours. After 42 hours, colonies were identified on the milk plate, and gram stains were made from each colony and viewed under a microscope. As a result, it was found that there were a variety of different kinds of bacteria on the top of the garbage lid before cleaning it with Sani Wipes, and culture after using the Sani Wipes showed no growth of bacteria. This concluded that Isopropyl Alcohol in the Sani Wipes works effectively in killing bacteria.

Effects of Heavy Duty Toilet Cleaner on the Toilet Bowl

Presenter: Harpreet Singh
Faculty Mentor: Dr. Raji Subramaniam
Department of Biological Sciences and Geology

Abstract:

Inside of the toilet bowl was swabbed before and after the toilet bowl was cleaned with a heavy duty toilet cleaner. The swabs were cultured on a milk plate and in selective media (EMB S110). After 48 hours for incubation the sample was further studied by Gram stain. Bacterial growth was seen in the sample taken from the toilet bowl before cleaning but no growth in the after sample. This study confirms that the active ingredient hydrochloric acid in heavy duty toilet cleaner is very effective in destroying bacteria in the toilet bowl.
Examining microRNA Regulation of Tissue Factor in Breast Cancer Tumor Progression

Presenter: Irene Sun
Faculty Mentor: Dr. Andrew Van Nguyen
Department of Biological Sciences and Geology

ABSTRACT:

Tissue Factor (TF), a transmembrane glycoprotein known originally as the initiator of blood coagulation cascade, was recently shown to be involved in cell signaling and angiogenesis. Furthermore, the activation of TF signaling pathway has been linked to many types of tumors. The mechanism by which TF factor is up regulated during tumor progression is not well known. We have recently demonstrated that anti-phospholipid antibody stimulates TF expression in less aggressive tumor cell lines. In our examination of the mechanism by which aPL stimulation leading to TF up regulation, we have focused on microRNAs (miRs). These are small 20-40 nucleotides known to regulate a number of gene expression. We are in the process of evaluating TF expression in two breast adenocarcinoma cell lines: a highly invasive cell line, MDA-MB-231, and a more dormant cell line, MDA-MB-468, by real time PCR. Interestingly, MDA-MB-231 intrinsically has higher expression of TF even in the absence of aPL treatment. We are currently working on the mechanism by which TF is up regulated in MDA-MB-231 by examining a number of microRNA’s known to bind to 3’ UTR of TF transcript. We also plan to evaluate whether aPL treatment will alter the expression of these miR’s in both MDA-MB-468 and MDA-MB-231 cell lines. We hypothesize that aPL antibody treatment can transform MDA-MB-468 dormant cells to become malignant via increased TF expression by down regulating specific miR.
Study of the Cytotoxic Effects of Carbon Nanotubes on Breast Cancer Cells

Presenter: Veronika Yakovishina
Faculty Mentor: Dr. Regina Sullivan
Department of Biological Sciences and Geology

Abstract:

Breast cancer is a major health concern in America today, with statistics showing that approximately 1 in 8 women will develop invasive breast cancer in her lifetime. It is critical to develop new, innovative methods to treat those with breast cancer without encountering side effects that typically arise during current treatments. The outlook once diagnosed is especially dim for those with triple negative breast cancer (TNBC). Biopsies from these patients display cells which are negative for the expression of estrogen receptor, progesterone receptor, and the HER-2/Neu gene. We will explore the effects of carbon nanotubes on two triple negative breast cancer lines. Single-walled carbon nanotubes (SWNTs) have been proposed as possible candidates for drug delivery vessels; however little is known about their cytotoxic effects. We will study the effects of SWNTs on mortality and proliferation as indicators of cytotoxicity of MDA MB 231 and MDA MB 468 cell lines.
Using Bioinformatics to understand Staphylococcus aureus

Presenter: Yueli Chen
Faculty Mentor: Dr. Peter Novick
Department of Biological Sciences and Geology

Abstract:

Staphylococcus aureus is a gram-positive coccal bacterium, was first identified by Alexander Ogston in 1880. Although this bacterium is often found in the respiratory tract and skin, it is not always infectious; however, there are many disease causing strains that are resistant to antibiotics and can be fatal. Using a series of bioinformatics tools (BLAST, T-coffee, TMHMM, SignalP, PSORT-B, Phobius, Tigrfam, Pfam) I will annotate some of this bacterium’s genes to determine the function of the final proteins, and to determine if they are in fact related to their pathogenicity.

Annotation of a Gene from the Pathogenic Bacterium Candidatus Phytoplasma

Presenter: Ted Pierre-Louis
Faculty Mentor: Dr. Peter Novick
Department of Biological Sciences and Geology

Abstract:

Candidatus phytoplasma Mali is among the most significant plant diseases that are caused by phytoplasma bacteria. Phytoplasmas are pathogens causing a wide variety of symptoms that range from mild leaf yellowing to death of infected plants. They are most common in tropical and subtropical regions of the world. To be passed on from plant to plant they need a vector or insect to transfer from plant to plant. One symptom of phytoplasma infection is called phyllody, the abnormal development of floral parts into leafy structures. Another symptom is caused by the phytoplasma presence in the phloem, affecting the plant’s ability to transport of carbohydrates. Using GENI-ACT, several unknown genes will be annotated to potentially elucidate how this bacterium is so infectious.
Using Tools of Bioinformatics to Research an Unknown Gene from the Bacterium Bacillus anthracis

Presenter: Jhamar Miller
Faculty Mentor: Dr. Peter Novick
Department of Biological Sciences and Geology

Abstract:

Bacillus anthracis is a rod shaped, gram positive spore bearing bacterium that is known for its ever-growing potential in biological warfare. It is commonly found in soil which makes herbivores susceptible to its effects. Though it is relatively rare for humans to become sick with anthrax, it can be easily transferred through contact with already infected animals as well as their products. Using GENI-ACT and various other resources I was able to use the nucleotide and protein sequences to analyze the unknown gene GBAA – 0181. Using multiple bioinformatics tools, I was also able to determine its product; a drug resistance transporter. Additional research will help determine the function of this protein. I hypothesize that this drug resistance is related to the pathogenicity of this bacterium.

Analysis of Unknown Genes of Acidobacterium Capsulatum

Presenter: Mercedes Polanco
Faculty Mentor: Dr. Peter Novick
Department of Biological Sciences and Geology

Abstract:

Acidobacterium capsulatum is gram negative non-spore-forming, capsulated, saccharolytic, rod-shaped bacterium. This organism is an aerobic, mesophilic, chemo-organotroph able to use a variety of carbon sources. They are motile by flagella and prefer an acidic environment. Commonly found in water reservoirs, microbial mats, and hot-springs, they form the dominant group in the habitat and are involved in the first step of destruction of biologically complex molecules produced by autotrophic microorganisms. The species comprises several strains characterized by orange pigmentation and production of menoquinones. Using GENI-ACT, several unknown genes will be annotated through various bioinformatics techniques to find out their probable function.
Genetic Insight into the Genome of the Biotechnologically Important Bacterial Species: Pseudomonas Syringae pv. Phaseolicola

Presenter: Elsa Rosario
Faculty Mentor: Dr. Peter A. Novick
Department of Biological Sciences and Geology

Abstract:

Pseudomonas syringae pv. phaseolicola is a plant-pathogenic bacterium that causes “Halo Blight” disease in beans, one of the major diseases affecting beans throughout the world. For this reason, this bacterium has become an important target in the biotechnology field. P. syringae is a gram-negative, polar-flagellated and non-spore forming bacterium that can be isolated from the leaf extract of a sick plant. Two unknown genes were chosen from the genome of this bacterium in order to be analyzed. In order to analyze and annotate these genes, bioinformatics techniques were used. Online databases such as, NCBI Blast, and GEN-ACT, were used to identify genes, their length, sequence, related microorganisms, and the possible proteins and functions these genes may encode.

The Optimization of a new 3D MCF-7 Breast Cancer Cell Culture Methodology to Measure Cell Death

Presenter: Maria Virginia Villadiego-Punto
Faculty Mentor: Dr. Karen Hubbard
CCNY, Department of Biology

Abstract:

Breast cancer therapeutics may be screened using human cultures. In this study, we monitored Doxorubicin induced cell death in a 3D culture system using MCF 7 breast cancer cells. The Syto 61 red fluorescent dye was employed as an indicator of viability by fluorescence microscopy. A new software algorithm was used that can capture images every hour for 48 hours for both bright field and fluorescence images. Doxorubicin was incubated with cells suspended in matrigel at varying concentrations (0,30 and 50 micromolar). Our results showed that concentrations of 30 and 50 micromolar Doxorubicin induced cell death in MCF 7 cells as few cells fluoresced within the first 12 hours. However, some cells were able to form clusters at later time points indicating that not all of the MCF 7 cells died, or that some cells had the potential to be drug resistant. Further studies are needed to clarify these issues.
Annotation of an Unknown Gene from the Heat Loving Bacterium
Thermus Thermophilus HB27
Presenter: Sinu Thomas
Faculty Mentor: Dr. Peter Novick
Department of Biological Sciences and Geology

Abstract:
Thermus thermophilus HB27 is a rod shaped, gram negative, heat loving, halotolerant, non-pathogenic bacterium. This species is isolated from a thermal vent within a hot spring in Izu, Japan. These species are mostly found in undersea volcanic thermal vents and have become crucial model organisms in research and industrial applications. Its genome consists of about 1,894,877 base pair chromosome harboring 2,218 genes. I was assigned some unknown genes from this heat loving bacterium. Using GENI-ACT through the Department of Energy, several genes will be annotated in order to determine additional characteristics/phenotypes of this species. Cellular location, enzymatic properties and phylogenetic relationships will help find the final function of these unknown proteins that may aid in their ability to thrive in such extreme environments.

The Effect of Novel Curcumin-Derivative CMC 2.24 in the Presence or Absence of Mitotic Inhibitors on Pancreatic Cancer Growth in Vitro
Presenter: Joselin Vargas
Faculty Mentor: Gerardo G. Mackenzie
Department of Preventive Medicine; Stony Brook Cancer Center
Department of Chemistry

Abstract:
Pancreatic cancer has one of the poorest prognoses among all cancers with a median survival of 6 months and a dismal 5-year survival rate of <5%. The currently limited treatment options for pancreatic cancer underscore the urgent need for novel chemotherapeutic agents. Extensive evidence has shown that curcumin can be a useful agent in the treatment of cancer. However, the anticancer properties of curcumin in humans are limited by its poor bioavailability characterized by decreased oral absorption and the need to use high oral doses of the compound. In an attempt to improve its bioavailability, our group has synthesized a novel chemically-modified curcumin (CMC2.24). In the current work, we evaluated the anticancer efficacy of CMC2.24 both alone and in combination with other chemotherapeutic drugs in vitro preclinical models of human pancreatic cancer. Vincristine, and Paclitaxel (taxol), are mitotic inhibitors that are FDA approved chemotherapy drugs used in combination with other anticancer medications. The effect of CMC2.24 alone or in combination with Vincristine or Paclitaxel on pancreatic cancer cell growth was examined in vitro using Microculture Tetrazolium Assay over 24 and 48 hours. In addition, apoptosis was analyzed using flow cytometry using similar treatment concentrations for 24 hours. CMC2.24 inhibited the growth of human Panc-1 cells in a concentration and time-dependent manner. Additionally, CMC2.24 proved to be a strong combination partner with Vincristine and Taxol; displaying synergy in the inhibition of pancreatic cancer growth. These results suggest that CMC2.24 appears to be a promising compound for the treatment of pancreatic cancer.
My Cousin
Presenter: Sabrina Alexis
Faculty Mentor: Dr. Eladia Raya
Department: Foreign Languages and Literatures

Abstract:
I decided to do my topic on my cousin. I will describe why it is I decided to her for my project. I will also describe her personality, and her characteristics, and her traits. I will also talk about her origin, and her hobbies, such as dancing because that is one of the biggest parts of her life. I will talk about her life, and how she grew up, and my relationship with her then, and now. I will write a 700-800 word composition and I will use power point to enhance my oral presentation. This is a course assignment associated with the Spanish Honors class for the spring 2015 semester.

Spain
Presenter: Asim Baig
Faculty Mentor: Dr. Eladia Raya
Department of Foreign Languages & Literatures

Abstract:
I will present a general overview of the beautiful country of Spain. I will mention important historical dates, and interesting traditions of its people and regions. Spain is a unique country full of culture and touristic interest. The objective is to share fascinating information about the country that the American public may not be aware of. I will write a 700-800 word composition and use a PowerPoint to enhance my oral presentation. This is a course assignment associated with the Spanish Honors class for the spring 2015 semester.

Italian Fashion: A Life Style
Presenter: Sherif Salah
Faculty Mentor: Dr. Maurizio Santoro
Department of Foreign Languages & Literatures

Abstract:
I will provide, in Italian, a brief biography of one of the most famous Italian fashion designers, Giorgio Armani. My presentation will also highlight the fact that being fashionable and trendy is a life style for Italians, a trait shared with my Egyptian cultural heritage. Pictures of Armani’s latest creations will be shown and described.
Mi Madre
Presenter: Ligia Bailey
Faculty Mentor: Dr. Eladia Raya
Department of Foreign Languages & Literatures

Abstract:

I will be talking about my favorite person in the world. I will describe my mother’s origin, struggles and triumphs. I will also show how caring she is and then express the respect and admiration she receives from others, including myself. I will talk about her demeanor, personality and appearance. Finally, I will describe her job, accomplishments, and future goals. I will be writing 700 to 800 words. I will also be using a PowerPoint presentation. This is a course assignment associated with the Spanish Honors class for the Spring 2015 semester.

My Mother's Experience Coming to America
Presenter: Maria Brango
Faculty Mentor: Dr. Maurizio Santoro
Department of Foreign Languages and Literature

Abstract:

I will narrate, in Italian, my mother’s unique story coming to America. In addition to describing the numerous difficulties she has experienced to be part of the new world, I will comment on how hard it has been for her to learn English. I will show her improvement over the years and what she has done in order to adapt to the new language and culture. Visual testimonials of her experience will be shared with the audience.

An Unforgettable Vacation with My Family
Presenter: Vincent Cacchione
Faculty Mentor: Dr. Maurizio Santoro
Department of Foreign Languages and Literature

Abstract:

I will describe, in Italian, a vacation I had in Myrtle Beach, SC, with my uncle, aunt, and several cousins. I will comment on how fun it was for me and my family. I will also describe the places I visited, the different foods I tasted, and the new people I met. Pictures of the places will be shown and described.
My Grandfather
Presenter: Joseph Ezratty
Faculty Mentor: Dr. Maurizio Santoro
Department of Foreign Languages and Literature

Abstract:

I will describe, in Italian, a very special person in my life, my grandfather. I will provide a brief biography including his childhood, his adulthood, and his family life. I will also stress his strong love for his family and friends. I will describe the beautiful moments I have spent with him and the numerous life lessons I have learned from him. In fact, I will also comment on the impact he has had on my growing up. Pictures representing my grandfather in different moments of his life will be shown and described.

Mi Deporte Favorito
Presenter: George H. Finney III
Faculty Mentor: Dr. Eladia Raya
Department of Foreign Languages & Literatures

Abstract:

My project will be about my favorite sport, which is professional football. I will describe how it is played. I will talk about its origin and I will describe the teams, their mascots and their cities. Also, I will describe my favorite team and how a came to like them while I watched with my father. Finally, I will talk my first times going to a professional football game three years ago. I will use PowerPoint to enhance my presentation. This is a course assignment associated with the Spanish Honors class for the spring 2015 semester.

The Story of My Life
Presenter: Laura Garcia
Faculty Mentor: Dr. Maurizio Santoro
Department of Foreign Languages and Literature

Abstract:

I will describe, in Italian, the most important milestones in my life. I will indicate where I was born, where I used to live compared to where I live now. I will talk about my experience in those amazing countries. My life has changed a lot, and I have changed, too, outside and inside. I will describe how I was before and how I am now. Testimonials of my growing up will be shared with audience.
Mi Abuela
Presenter: Adrian Gil
Faculty Mentor: Dr. Eladia Raya
Department of Foreign Languages & Literatures

Abstract:

My project will be about my grandmother. I will describe my grandmother. I will talk about her origin, and I will describe her personality traits and characteristics and her hobbies, daily activities, and things that are important to her. Also, I will describe her childhood. Finally, I will describe her job and accomplishments. I will write a 700-800 word composition, and I will be using a PowerPoint to enhance my presentation. This is a course assignment associated with the Spanish Honors class for the spring 2015 semester.

My Grandfather
Presenter: Daisy Gonzalez
Faculty Mentor: Dr. Maurizio Santoro
Department of Foreign Languages and Literature

Abstract:

I will describe, in Italian, a very special person in my life, my grandfather. This will be a story of a man that even though he is in heaven now, left a mark on every person he met. I will, in fact, comment on how he was able with my grandmother to raise a family starting from nothing. Pictures of me and him together will be shared with the audience.

How Self-Discipline Changed My Life
Presenter: Craig Hollis
Faculty Mentor: Dr. Maurizio Santoro
Department: Foreign Languages and Literature

Abstract:

I will describe, in Italian, the most important moments in my life. I will write about of when I received my black belt in Taek won do after 10 years of training, and when I graduated from the Marine Corps boot camp. I will also comment on how self-discipline changed my life. Pictures of these important moments will be shown and described.
My Family
Presenter: Kharise King
Faculty Mentor: Dr. Eladia Raya
Department of Foreign Languages & Literatures

Abstract:

I will write an essay about my family. I will talk about the origin of all the members of my family. I’ll give a physical description of them and their personalities. Also, I will discuss their professions and hobbies. Finally, I will define my relationship to my family members, and I will talk about our favorite activities together. I will write a 700-800 word composition, and I will use PowerPoint to enhance my oral presentation. This is a course assignment associated with the Spanish Elementary II Honors class for the spring 2015 semester.

Daily Life Lessons from Doctors
Presenter: Daniel Kwon
Faculty Mentor: Dr. Eladia Raya
Department of Foreign Languages & Literatures

Abstract:

My objective is to write about my work experiences as a medical scribe at CityMD, an urgent medical care clinic in Jackson Heights, a predominantly Spanish community. Working in the Jackson Heights community was my main motivation for taking Spanish classes at Queensborough Community College. I will also write about my experiences working with Dr. Joseph, Dr. Venegas and Dr. Singh and the various lessons, both work related and non-work related, that I’ve learned from them. I will write a three page composition and use PowerPoint to enhance my presentation. This is a course assignment associated with the Spanish Elementary II Honors class for the Spring 2015 semester.

Italian Fashion
Presenter: Jay Lucero
Faculty Mentor: Dr. Maurizio Santoro
Department of Foreign Languages and Literature

Abstract:

My presentation will consist of a brief history of Italian fashion designers and companies that have become popular in America. I will also comment on how Italian style has influenced American pop culture and urban attire. Brands such as Versace, Dolce & Gabbana, and Prada are all Italian names that have impacted American fashion.

Pictures of their latest creations will be shared with the audience.
The Most Important Moments in My Life
 Presenter: Baruj Mackliff  
 Faculty Mentor: Dr. Maurizio Santoro  
 Department of Foreign Languages and Literature

Abstract:

My project is based on some of the major milestones in my life. It begins with my first acting performance in elementary school to continue with my experience as a dog trainer. I will also comment on my accomplishments as a soccer player, and how I survived when I ended up living by myself at the age of seventeen.

Giovanni Pierluigi da Palestrina: an Italian Composer
 Presenter: Jonathan Rodriguez  
 Faculty Mentor: Dr. Maurizio Santoro  
 Department of Foreign Languages and Literature

Abstract:

For my honors project, I will write, in Italian, about Giovanni Pierluigi da Palestrina. Giovanni da Palestrina was an Italian Renaissance composer of sacred music. He's known for his heavy use of polyphony in all of his compositions. I will provide a brief biography, and will comment on his musical accomplishments, and legacy. At the end of the presentation, I will play a short portion of one of his well-known compositions.

My Favorite Aunt
 Presenter: Maria Saccente  
 Faculty Mentor: Dr. Eladia Raya  
 Department: Foreign Languages and Literatures

Abstract:

My objective is to write about my favorite aunt, Angela. She a very important person in my life and that’s why I decided to base this assignment on her. I will describe my aunt’s physical features, her origin, her personality traits, her hobbies, her profession, her daily activities, etc. I will also describe in some detail about her life and growing up with her in my life. I will write a three page composition about 700-800 words. I will use PowerPoint to enhance my presentation. This is a course assignment associated with the Spanish Honors class for the spring 2015 semester.
Bypassing Established Limits: the Development of Super-Resolved Fluorescence Microscopy

Presenter: Juan Javier Arcenas
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

Abbe’s diffraction limit, detailed in the nineteenth century by the microscopist Ernst Abbe, explained the limits to optical microscopy in terms of the wavelengths of light used. In the decades since, methods of approaching or even bypassing this limit have been in development. Recently, a means of bypassing Abbe’s diffraction limit by an incredibly high degree of magnitude has been discovered, that involves the use of fluorescent molecules and STED (stimulated emission depletion) microscopes. Green fluorescent proteins were manipulated to reach a wavelength in the scale in the hundreds nanometers, which defies the limit prescribed by Abbe of only 0.2 micrometers. This was the subject of the 2014 Nobel Prize in chemistry, significant in part due to the fact that optical microscopy has now been taken into the new dimension of nanoscopy.

Amino Acids (Protein) Presenter:
Myo Thandar Aung Faculty Mentor: Dr. Moni Chauhan Department of Chemistry

Abstract:

Amino acid is an organic compound that consists of amine (-NH2) and carboxylic acid (-COOH) and are essential for our daily life. There are 20 common naturally occurring amino acids in our human proteins. Protein is a linkage of different or same amino acid groups and about 20% of human body is made up of proteins. Amino acids are important to repair our cells, healing wounds and tissues such as muscles or skin and a lack of protein will lead to serious illness. Amino acids are soluble in water as zwitterions and are able to from strong ion-dipole interactions (hydrogen bonding) with water molecules. Zwitterion is a natural dipolar ion which has one positive and one negatively charge. Due to this transfer of proton (H+) within an amino acid, amino acids can act as a buffer solution. This functional property helps our cells to stabilize and achieve balance metabolism. However, denaturation of protein will lose its (amino acid) stability and decrease in the solubility or precipitation of protein. For example, an over-consumption of alcohol can lead to high changes in pH level of body and disrupt the amino chain. This will lead to serious illness or diseases. Hence, it is important to maintain healthy diet.
The Importance of pH in the Human Body

Presenter: Francisco Caban
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

The equilibrium of the pH scale is very important in our everyday lives. The pH scale is a measure on how acidic or basic a substance is and is dependent on the hydronium ion concentration in that solution. The scale is rated from 1-14, a pH of 1 being the more acidic and a pH of 14 being extremely basic. The balance of both acids and bases are a vital part for the functioning of different organs. For example the kidneys and lungs are two organs in the human body which together help to maintain the pH in the blood at 7.4. They do this by keeping a constant supply of carbonic-acid-bicarbonate buffer in the blood. Since there is excess of carbonic-acid-bicarbonate in the blood any acid or base which enters the blood would be neutralized. Even though our body has many different organs with different pH values, stomach at pH of 1-2 and lower part of the intestine at 7, the blood needs to maintain the pH for proper functioning of all the body systems. In this presentation, the composition of the human blood and how it acts as a buffer in different parts of the body will be discussed.

Ethanol Production from Cellulose

Presenter: Carlos Correa
Faculty Mentor: Moni Chauhan
Department of Chemistry

Abstract:

Ethanol is the world’s most widely used renewable fuel. About 13 million gallons of ethanol are produced worldwide annually, and the US alone consumes over 9 billion gallons per year. Most of the ethanol currently produced is obtained through fermentation of simple sugars from feedstocks such as corn, and potato crops. However, the increasing demand for ethanol has raised concerns related to increased food prices as well as food shortage. For this reason, production of ethanol from cellulose has been an area of intense research over the last decade. Cellulose is the most abundant renewable organic compound on earth, composed of hundreds to thousands of polysaccharide linear chains of glucose molecules linked by β-1, 4-glycosidic bonds. Cellulose, along with hemicellulose, and lignin serve primarily as structural support for green plants, oocytes, and some algae, but it can also be used to produce ethanol. Production of ethanol from cellulose however requires the hydrolysis of the molecule into its individual glucose monomers. Two major ways of achieving this have been developed: enzymatic and chemical. Although enzymatic hydrolysis of cellulose seems to offer the potential for higher yield percentage of glucose product, the amount of enzymes needed to achieve it, exceeds the cost required for subsequent studies. This opens the option of research for the use of chemical hydrolysis. The use of acids and alkalis as catalysts for the hydrolysis of cellulose appears to hold a promising future in a more efficient method for the production of ethanol.

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Catalysts: Effect on Human Body

Presenter: Neeraj John  
Faculty Mentor: Dr. Moni Chauhan  
Department of Chemistry

Abstract:

Catalysts are very important. They accelerate the rate of chemical reactions. Enzymes are natural occurring catalysts which accelerate biological reactions and make life possible. Like catalysts, enzymes take part in the reactions but they do not go under permanent change. Enzymes are highly selective and each enzyme binds onto its specific substrate. For a reaction to occur, the enzyme and substrate should collide at specific orientation and with specific energy. There are factors that influence the rate of enzymatic reactions. One is the concentration of enzyme, and the second is the concentration of the substrate. The rate of the reaction increases with an increase in enzyme concentration. The second factor is the temperature. As the temperature increases, the kinetic energy of the molecule will increase and the probability of collision also increases. There is a particular temperature at which the rate of the reaction reaches maximum. If the temperature increases above the optimum temperature, the enzyme undergoes denaturation. The pH has also same effect on reaction rate, when there is an optimum pH at which the reaction rate is maximized. If the pH varies considerably, denaturation occurs.

Importance of pH in Skincare Products

Presenter: Krystal Lee  
Faculty Mentor: Dr. Moni Chauhan  
Department of Chemistry

Abstract:

The face is the first thing a person sees when looking at someone else. The skin of the face, with the assistance of free radicals and aging, will start to wrinkle and sag. For skin to maintain its youthfulness, it needs to be mindful of the products used to wash and moisturize it. The initial pH level of the skin is acidic, ranging within the pH of 4. During the basic steps of skincare routine, cleansing, toning, and moisturizing, the products do their main jobs, all the while preserving the skin’s pH. However, there are some rare cases when a person decides to wash their face with bar soap. The basic properties of soap tamper with the pH of the skin, instigating the aging process due to the insufficient amounts of acid required to neutralize for a balanced pH and glowing complexion.
Tris-[3-(Trimethoxysilyl)Propyl]Isocyanurate (Ttpi) and Polymethylhydrosiloxane (Pmhs) Gels In Acidic Medium

Presenter: Jeff Massena
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

Polymer coating of surfaces is of great importance due to their industrial applications, however it’s a challenge to obtain such materials. Good coating material is expected to have unified thickness, elastic properties and good adhesion to the substrate. Tris-[3-(trimethoxysilyl)propyl]isocyanurate (TTPI) is an excellent adhesion promoter and crosslinking agent. The nine trimethoxy groups present on the isocyanurate ring were hydrolyzed in the presence of moisture and acid as catalyst to generate Si-O-Si bonds. Polymethylhydrosiloxane (PMHS) on the other hand has several Si-H linkages converts to Si-OH bonds in the acidic medium and then co-condense with TTPI to generate carbonyl functionalized sol-gel material with porous structures. Materials prepared by this strategy were investigated via FT-IR, SEM and TGA analysis for structural characterization. IR analysis clearly indicates Si-O-Si absorption band at 1,081 cm\(^{-1}\) and disappearance of Si-H absorption frequencies. Given the possibilities of varying proportions of the TTPI and PMHS possible control on the structure, density, and functionalization of silicon wafers and glass plates with this hybrid gel were investigated.

Major Affective Disorders: Lithium Action on the Treatment of Bipolar Disorder

Presenter: Wilson Nieves
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

Lithium salts have been widely used as treatment for several acute neurological disorders such as bipolar disorder. The salt, lithium carbonate (Li2CO3) produces Lithium ions (Li\(^+\)), which mainly deal with the manic state in bipolar disorder by interfering in the normal maintenance of normal levels of inositol (PI cycle) in nervous system cells, by regulating the activity of enzyme proteins such as protein kinase c (PKC) and glycogen synthase kinase-3 (GSK-3), by providing neurotrophic effects that help in the protection of neurons, preventing the degeneration of neural cells, by inducing normal signal transduction effects, ion transport and gene expression; leading to a useful treatment of bipolar disorder.

Although the actual mechanism of action of lithium in bipolar disorder is yet to be found, important studies have demonstrated that lithium uses in the pharmacological world help in the treatment of several neurodegenerative disorders such as schizoaffective disorders, major depression, and bipolar disorder. Lithium is extensively used to treat psychiatric and psychological disorders in an effective way. Thus, understanding the actual action of lithium can lead to the creation of improved drugs and promising results, evading any secondary effects.
The Chemistry of Food Coloring and the Effects it has on Human Health  
**Presenter:** Kristina Papacostas  
**Faculty Mentor:** Dr. Moni Chauhan  
**Department of Chemistry**

**Abstract:**

Food colorings or color additives have been around since 5000 B.C., serving various purposes and coming in several different forms. Having been greatly renovated over the past few decades, the same purposes still remain. Although with increased consumption there is now an increased risk in health issues especially among young children. The art of chemistry is what makes these dyes known to be in existence. Because food dyes come in different forms, not all are created in the same manner. Food coloring, which is used to enhance the appearance of food can include natural colors, inorganic pigments, combinations of organic and metallic compounds (lakes), and synthetic coal-tar substances. Of the many food dyes known to man, only seven are approved under the Pure Food and Drug Act. While three of the dyes are known to be carcinogen carriers and four can cause serious allergic reactions, they are still permitted by the FDA to be used in foods. Although there has not been enough concrete evidence to prove it being true, many tests that have suggested that there is indeed a linkage between food colorings and health related issues ranging from cancer to hyperactivity to allergy like reactions.

Chemical Messengers of Plants  
**Presenter:** Niki Patel  
**Faculty Mentor:** Dr. Moni Chauhan  
**Department of Chemistry**

**Abstract:**

Plants are an important part of our ecosystem. They have very complex chemistry. The plants are not verbal but they produce chemical messengers to coordinate growth, development, and response to stimuli. Plants produce chemical messengers in one region but can have physiological effect on targeted tissue on any location. In this presentation the physiological effect of plant hormones such as auxin, ethylene, and salicylic acid will be discussed. An auxin is a chemical messenger that promotes elongation of coleoptiles. The common auxin in plants is an indole acetic acid (IAA). IAA is chemically related to the amino acid tryptophan. It enhances fruit development, stimulates release of ethylene, and prevents abscission. The second hormone “Ethylene” is very important hormone in plants. The chemical formula of an ethylene is H2C-CH2. Plants produce ethylene in response to stresses such as drought, flooding, mechanical pressure, injury, and infection. An Ethylene also causes ripening of fruits, formation of aerenchyma tissue in submerged stems, and determines sex in cucurbits. At last, salicylic acid is usually synthesized around infection site and signal that triggers systemic acquired resistance for plants defense mechanism.
ELISA: Using Primary and Secondary Antibodies for Diagnosis and Detection of Diseases

Presenter: Daysi Proano
Faculty Mentor: Dr. Moni Chauhan
Department of Biological Sciences and Geology

Abstract:

ELISA (Enzyme-Linked ImmunoSorbent Assay) is a test that detects if antibodies are in the blood after being exposed to a disease. ELISA test are widely used to identify substances that have antigenic properties. Antigens are molecules that cause a prompt response in the immune system called antibodies. The antibodies that recognize antigens disease agents are called primary antibodies. The secondary antibodies, from different species, recognize and bind to primary antibodies. In this project, secondary antibodies are the conjugate enzymes (HRP) that produce a blue color in the presence of its substrate (TMB). If primary antibody is present in the serum sample, the wells turn blue and it is a positive diagnosis. If the wells remain colorless, the primary antibodies are not present in the serum samples and the diagnosis is negative. Details about quantitative ELISA: concentration controls, and experimental ELISA with unknown patient samples will be explained in the presentation.

Graphene Super Capacitors

Presenter: Nicholas Rand
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

In our current age of technology, the storage of energy is of the utmost vital importance, and the most common way we can store that energy is via battery. When we look at our own mobile devices and their batteries, we always wish we had just little bit more charge left, and regret playing that last game, but not anymore will we need to wish that with the assistance of a graphene supercapacitor. When batteries are charged, they convert electrical energy into chemical energy for storage and when the time comes, it turns back into electricity. It sounds good on paper, but as it turns out, they are not efficient at all, and you can know that just from experience with a portable electronic. The difference between a battery and these supercapacitors is that instead of storing energy in a chemical form, the supercapacitor stores it just as is, in its electrical form, and charge in extremely much less time. Depending on the size, it can store almost as much as a lithium-ion battery in about 16 seconds. The likelihood of it replacing batteries is extremely high, since they are extremely cheap, efficient and are environmentally friendly, because they are carbon based. Eventually, hopefully in the near future, these will be available for commercial production.
Anisotropic Silver Nanoparticles Synthesized in DMF

Presenter: Rahel Steffen
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

Synthesis of metal nanoparticles involves two steps- reduction and stabilization. Such particles will keep growing in the absence of a stabilizing agent and precipitate out of the solution. Monomer and long chain polymers are used to prevent the collapse of the particles whereas electrostatic stabilization is achieved by salts where similar charges provide repulsion between the particles. Control of Silver nanoparticles morphologies and shapes contribute to potential applications in catalysis and Surface Enhanced Raman Spectroscopy. In this study, TTPI (Tris(3-trimethoxysilylpropyl) isocyanurate) has been used as a stabilizing agent and the optical behavior of silver nano particles in DMF depends on the method of preparation of these particles. On tweaking the reaction conditions, time period for which the reaction was heated and the ratio between silver nitrate and TTPI, we were able to obtain either spherical or decahedron particles. Infra-red data indicates sol-gel polymerization on to the surface of the particles.
Nuclear Power is the Future Energy

Presenter: Alexander Sullivan
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

Electricity demand has grown in the past ten years and the demand is expected to grow even more within next ten to twenty years. Nuclear power plants produce greater amount of energy than fossil fuel plants and are also more environment friendly. Nuclear power is created from a process called nuclear fission of Uranium-235, where splitting of U-235 into smaller atoms takes place. The electricity is produced in a clean and efficient way by converting water into steam which in turn rotates the turbines to produce electricity. Unlike fossil fuels nuclear plants do not produce greenhouse gases. Since fission of U-235 is a chain reaction which produces enormous amounts of heat, water is used to control the heat and graphite is a moderator to control the reaction.
Opiates: Mechanisms

Presenter: Irene Sun
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

Throughout history, opioids have been used in the medical community for the treatment of pain. They aid to reduce pain signals to the brain originating from effects of painful stimuli. Generally, drugs are prescribed for short-term use. Over time, however, patients may start to rely on the medication by taking the drug for longer periods of time, which leads to addiction. The mechanisms and effects of opiates towards the human central nervous system along treatments will be discussed in detail.
Effects of Acid Rain on the Environment

Presenter: Wesbee Victor
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

Acid rain is rain with a higher concentration of positively charged atomic particles (ions) than normal rain. This research will discuss the effects of acid rain on the environment. Acid rain occurs when sulfur dioxide and nitrogen oxide are emitted into the atmosphere. They undergo chemical transformations and are absorbed by water droplets in clouds. Acid rain is one type of atmospheric deposition. In order to understand the components of acid rain, it is important to chart the path of its evolution, what evolutionary forces caused it to happen, and what its effect is on the environment. Furthermore, in this presentation the importance of measuring the acidity of rain and acid rain reduction techniques will be discussed.

Acid Deposition and its Effects on the Environment

Presenter: Juan Nieto Zapata
Faculty Mentor: Dr. Moni Chauhan
Department of Chemistry

Abstract:

The term acid deposition is a catch all term for natural events such as rain, fog, snow and mist with high acidity or a pH of 4 or less. Acidity is a measure of the concentration of hydrogen ions and can be measured by a pH scale which measures how acidic or basic a substance is within a scale of 0 through 14. A pH reading of 7 is neutral while a reading lower than 7 is considered acidic and a reading higher than 7 is basic. Although natural weather phenomena can be weakly acidic due to chemical reactions such as the absorption of Carbon dioxide in the atmosphere, it is not enough to make much of a negative impact on the environment. Industrial process such as the burning of fossil fuels are the main culprits of acid deposition. Acid deposition can cause severe negative effects on our environment such as the acidification of soil, disrupting the chemical balances in bodies of water and causing negative health effects in both animals and humans.
Geospatial Solution for Recruiting Students at Bronx Community College

Presenter: Amos Addy
Faculty Mentor: Dr. Sunil Bhaskaran
Department of Chemistry & Chemical Technology
Bronx Community College, Geospatial Center of the CUNY CREST Institute

Abstract:

As the number of colleges and autonomous institutions increase in numbers student recruitment for existing colleges and institutions become a huge challenge. We present a methodology by which colleges and institutions can employ geocoding techniques to map the catchment of students enrolled at their institutions and also understand the reasons behind their choice. Furthermore, mapping these spatial patterns may provide additional insights into target areas for future recruitment, presence of any transportation barriers and other related hindrances to recruitment. A geocoding function was used in a geographic information system environment to map the location of students based on their addresses with their reasons for choosing a specific college.

Space Management at BCC with Geospatial Technology

Presenter: Amos Addy
Faculty Mentors: Mr. Dhruvkumar Bhatt, Dr. Sunil Bhaskaran
Bronx Community College Geospatial Center of the CUNY CREST Institute

Abstract:

Space management of physical resources at educational institutions is important for scheduling classes, events and managing limited resources. We present a methodology to design an interactive space management system that is capable of providing information upon querying. The methodology involved the creation of a graphical user interface (GUI) in a geographic information system (GIS) environment. Floor plans were digitized and application programming interfaces (APIs) were used to create a customized GUI. The interface would have capabilities to query the locations of buildings on campus, manage the inventory and fly through the campus in 3-D mode. The project would provide users to have a superior understanding of locations of features on campus and will assist the administrators of the college to better manage their resources. The project has the potential to impact all divisions and departments of the college.
Modeling Satellite and Census Data for Investigation of Pollution in the Harlem River

 Presenter: Augustine Amissah  
 Faculty Mentor: Dr. Sunil Bhaskaran  
 Department of Physics, Bronx Community College

Abstract:

The study aims to attempt a holistic investigation of water pollution in the Harlem River. The methodology included chemical and geospatial analyses. In the first phase, random water samples were collected from the Harlem River and tested for the presence of ammonia, bacteria and turbidity of the water. In the second phase we created detailed land cover and land use map of the study area using remotely sensed data. Different classification methods were done on the satellite imagery downloaded for the study site. Maximum Likelihood classification was the focus as it normally distributes assigned pixels base on a feature class. The classified image was integrated with different census data for modeling the socio-economic dynamics in the area. Accuracy assessment was used to determine the error and accuracy of the likelihood classification. The anticipated results may be used to show dynamic factors that may be influencing pollution in the Harlem River.

Computation of Spectral and Spatial attributes from High Resolution Satellite Data

 Presenter: Leroy Brown  
 Faculty Mentor: Dr. Sunil Bhaskaran  
 Department of Physics, Bronx Community College

Abstract:

The continuous growing of urban cities requires proper management of resources that demands spatial and spectral attributes which gives information about terrestrial target objects. The paper describes innovative methods of extracting target objects from worldview-2 MSS Dataset over the Bronx Borough in New York. Spatial and spectral attributes were computed to build algorithms that were used to extract different sets of target objects from the imagery. The algorithms were tested on a study area and the accuracy of the classification was estimated using the confusion matrix model. Results show that several target objects form urban areas such as the Bronx may be extracted in near-real time from satellite data. The approach described in the study may be applied to any geographic region that has similar characteristics to the Bronx.
Mapping Urbanization Patterns in New York City with Fused Radar and Optical Data

Presenter: Mr. Leroy Brown
Faculty Mentor: Dr. Sunil Bhaskaran

Department of Physics, Bronx Community College

Abstract:

This study focuses on the development of innovative classification techniques to map urban and environmental features form time-series of multi-sensor, multi-resolution space borne data. Per-pixel and object based methods was employed on fusing optical and fine resolution ultra – fine beam and polarized microwave satellite data. Innovative data fusion techniques were developed by using Intensity Hue Saturation (HIS) transform wavelet and other methods. Anticipation results will demonstrate a classification model that could be useful to different applications including urban planning, land cover mapping and natural resources management. Other results will include new data fusion technique that may be used in fusing multispectral optical and microwave radar data.

Investigating an Archaeological Site Using Geophysical Analysis and Geospatial Technology

Presenter: Nicaela Cartagena
Faculty Mentors: Dr. Sheldon Skaggs and Dr. Sunil Bhaskaran

Department of Chemistry

Abstract:

The purpose of this study is to investigate the archeological site of Pacbitun using geospatial and geophysical analysis. The study area is located in San Antonio, Belize and includes two areas, the site of Pacbitun and an outer site called Mano Mound. A geographic information system software was used to create a digital map of both study areas. The geophysical instrumentation such as a magnetometer and ground penetrating radar allows the investigator to see any points of interests that are buried within the ground. The study area of Pacbitun was digitized using present day roads and structures. The expected plan is to use both techniques of geospatial technology to digitize the area of Mano Mound as well as to use geophysical data to find any possible connection of both study areas. This connection may then lead us to understanding more about the Mayans lifestyle in their last years.
Comparison of a Mount and Structure of Iron in Different Plants

Presenter:  Krystal Lee, Clarence Ma
Faculty Mentor:  Dr. Sunil Bhaskaran
Department of Physics, Bronx Community College

Abstract:
Iron is an essential nutrient not only for humans, but also for all types of plants. Plants use iron for chlorophyll formation, RNA metabolism, and transpiration process regulation. Iron is one of the most abundant metals in the soil and occurs in a wide range of chemical forms. Humans receive iron through meat(Heme-iron) products and plants (non-Heme). Non meat eaters depend on plants for their iron. Almost all green leafy vegetables contain iron. But amount of iron per gram of leave is different in different plants. Also the atomic structure may differ from a plant to plant. X-ray absorption spectroscopy (XAS) is a valuable tool to determine the amount of iron present in a particular sample and atomic structure around the iron atom. Results obtained from different plant tissue samples will be presented.

Mapping Socio-Economic Variables in the Bronx for Planning and Development

Presenter:  Keysha Morales, Genesis Cabrera, Raymond Ocasio
Faculty Mentor:  Dr. Sunil Bhaskaran, Robert Baskerville, Donna Mangiante-Naughton and James Freeman
Department of Chemistry & Chemical Technology
Bronx Community College

Abstract:
The Bronx is one of the least developed areas in the country. The demographic characteristics and socio-economic variables present a unique challenge to developmental activity and long term planning. A detailed understanding of the Bronx hinges on the spatial distribution of the socio-economic variables and population characteristics. We present a methodology by which the demographic characteristics and socio-economic indices may be mapped and visualized. By using a geographic information system software different variables in the Bronx may be mapped and analyzed. The methodology includes extraction of variables from the census department and combining such data with the geographical boundaries (Tiger files). The maps show the spatial distribution of variables that may be used for different applications particularly those that are required in sociology related research.
Designing a Socio-economic Atlas for New York City

Presenter: Keysha Morales, Roshea Robinson, Daquasia Wright
Faculty Mentor: Dr. Sunil Bhaskaran, Robert Baskerville, Donna Mangiante-Naughton and James Freeman

Bronx Community College, Department of Chemistry & Chemical Technology

Abstract:

Scientific research is essential to improve the lifestyle of people. However, the results from any scientific research cannot be implemented until there is a clear understanding of key social variables such as population density, socio-economic distribution, ethnicity and so on. There is no comprehensive database on the socio-economic and population variables in New York City and even if there is it is fragmented and available only with a few vendors or researchers. We present a methodology to design a socio-economic atlas of New York City that shows all important variables in a map and ready-to-use format. The data will be available on a website for all users in the City and nation. We believe the datasets will enable people to use the information for various developmental and planning related activities. One of the unique features of the atlas will be the integration of socio-economic data with high resolution satellite data.

Multi-scale Analysis of Satellite & Census Data for Investigating Pollution

Presenter: Modou Sene
Faculty Mentor: Dr. Sunil Bhaskaran

Bronx Community College, Department of Chemistry & Chemical Technology

Abstract:

The study aims at developing innovative ideas for the mitigation of water pollution in the Harlem River by combining chemical and geospatial analyses. Our methodology consisted of analyzing remotely sensed images in the study area at multiple scales and classifying them. A supervised classification using the Maximum Likelihood Classification (MLC) approach was employed. A detailed land cover map of the study area was then integrated with socio-economic variables such as population density, socio-economic variables for modeling the socio-economic dynamics in the area that may influence the type, amount and cause of pollution in the Harlem River. The anticipated results may be used to show the dynamic factors that may be influencing the pollution of the Harlem River.
Contextual Learning for Improving Success Rates in Math and STEM Disciplines at BCC  
**Presenter:** Tawfic Siiba  
**Faculty Mentor:** Dr. Sunil Bhaskaran, Mr. Neal Phillip and Ms. Uma Iyer  
*Bronx Community College, Department of Chemistry & Chemical Technology*

The continuing low success rates of students enrolled in Mathematics, Chemistry is a worrying trend at BCC-CUNY. Whilst the City University of New York (CUNY) success rates is 49%, the Bronx Community College (BCC’s) stands at 40%. This is a worrying trend and a matter of great concern at BCC. Whilst conventional methods of teaching have not registered the desired results or success rates yet, there may be a need to develop other innovative methods for teaching Math and STEM courses. The proposal focuses on designing and developing such innovative courses by a multidisciplinary and collaborative model. The methodology involves using a high resolution satellite data over the Bronx and designing number of exercises that will stimulate learning in Math as well as an understanding of geospatial technology. Users will be able to make calculations from the images and acquire a better understanding of measurement techniques, conversions, proximity by working with real-work problems. We will test this contextual approach in teaching math and generate feedback from selected group students. The feedback will provide information about the approach and advise us for the next phase.

Investigation of Chemical Nature and Distribution of Iron within a Plant  
**Presenter:** Rahel Steffen  
**Faculty Mentor:** Dr. Sunil Bhaskaran  
*Bronx Community College, Department of Physics,*  
**Abstract:**

Spinacia oleracea, or commonly named as spinach, is a well-known plant that contains iron. The amount of iron present in different parts of the plant and chemical environment of iron atoms is not known precisely. Iron present in this plant was investigated using X-ray absorption spectroscopy (XAS). Tissue samples collected from different regions of a plant was dried at 200°C grinded to fine powder form. X-ray absorption spectra of samples were collected at the National Synchrotron Light Source of Brookhaven Laboratory for the energy range of 6900 to 8100eV. The main absorption peak of the absorption spectrum is proportional to the amount of iron present in the sample. According to the data most mature leaves contains highest amount of iron. Most of the iron present in the samples has the form Fe3+ or electron density at the site of the iron nucleus similar to that of Fe3+.
Investigation of the Surface Energies of Carbon Nanostructure Filled Polypropylene Composites

Presenters: Raul Rivas, Charles Seaks, Titus Gaertner, Petra Poetschke
Faculty Mentor: Dr. Vicki Flaris
Bronx Community College, Department of Chemistry

Abstract:

The abundance of plastic waste today necessitates the versatility and reusability in the polymers we manufacture and recycle. Our research investigated the surface energies of polypropylene composites with four different carbon based fillers. The four fillers used are single walled carbon nanotubes (SWCNTs), multi walled carbon nanotubes (MWCNTs), carbon nanohorns (NHs), and carbon nanodiamonds (NDs).

Our results show that as the amount of carbon fillers increased, the contact angle decreased. The lone exception to this was when heptane was used on the MWCNT composites, which yielded an increase of the contact angle. The MWCNT also showed gradual reduction in surface energy as the amount of filler increased. The surface energies of the other composites increased as the amount of filler increased. These results using a nanosyringe agree with previous findings using a larger diameter syringe.
ORGANIC SOLAR CELLS
Presenter: Francisco Caban
Faculty Mentor: Dr. Sujun Wei
Department of Chemistry

Abstract:

The C60 fullerene based acceptor readily accepts electrons from a wide range of donor materials and exhibits high electron mobility. However, fullerene is not an ideal material due to its weak absorption and very deep LUMO level. Therefore there is a clear need for alternative acceptor materials. We propose to synthesize X-shape molecules as electron acceptors via strain and Hückel aromaticity as the driving forces. The molecule’s bottom half is a fluorene unit, and the top half is a fused heterocyclic ring. Both motifs are twisted along a central double bond. We have synthesized our first target in 4 steps. Its structure was confirmed by H-NMR and C-NMR, and its optical & electrical properties are under pursuing.

Synthesis of X-Shape Molecules as Electron Acceptors in Organic Solar Cells
Presenters: Francisco Caban, Yi (Jane) Jiang
Faculty Mentor: Dr. Sujun Wei
Department of Chemistry

Abstract:

The C60 fullerene based acceptor readily accepts electrons from a wide range of donor materials and exhibits high electron mobility. However, fullerene is not an ideal material due to its weak absorption and very deep LUMO level. Therefore there is a clear need for alternative acceptor materials. We propose to synthesize X-shape molecules as electron acceptors via strain and Hückel aromaticity as the driving forces. The molecule’s bottom half is a fluorene unit, and the top half is a fused heterocyclic ring. Both motifs are twisted along a central double bond. We have synthesized our first target in 4 steps. Its structure was confirmed by H-NMR and C-NMR, and its optical & electrical properties are being pursued.
Microwave-Assisted Synthesis of Imidazolium-Based Ionic Liquids for Ionothermal Reactions

**Presenter:** Yueli Chen, Edward Fernandez  
**Faculty Mentor:** Dr. Sharon Lall-Ramnarine, Dr. Paul Sideris  
**Department of Chemistry**

**Abstract:**

LiFePO4, an attractive cathode material for lithium-ion batteries, is frequently synthesized using a high temperature ceramic method. This strategy is energy intensive and offers no control over particle morphology. Ionothermal synthesis, which utilizes ionic liquids as both solvents and structure directing agents, is an alternate strategy that requires relatively low temperatures. Here, we report the microwave-assisted synthesis and characterization of a family of imidazolium-based ionic liquids containing hydroxyl-terminated alkyl chains of various lengths for use in the ionothermal synthesis of cathode materials.

Designing Asymmetrical Dicationic Ionic Liquids

**Presenter:** Edward Fernandez  
**Faculty Mentor:** Dr. Sharon Lall-Ramnarine  
**Department of Chemistry**

**Abstract:**

Ionic liquids (ILs) have gained popularity recently as greener alternative solvents in energy applications, thanks to their low volatility and high conductivity, as well their ability to be recycled. However, their high viscosity has been a limiting factor in large scale applications. This project aims to synthesize and investigate the properties of novel asymmetrical dicationic ILs of lower viscosity, an area generally unexplored compared to symmetrical dicationic ILs. The asymmetrical halide salts were prepared by reacting a tertiary amine with a dihaloalkane and then attaching 1-methylimidazole. The asymmetrical halide salt precursor was then reacted with Lithium Bis(trifluoromethylsulfonyl)amide (NTf2) to yield an asymmetrical NTf2 ionic liquid. We have successfully synthesized and partially characterized dicationic ILs to be used in a parallel project on binary mixtures of ILs where dications are of interest. Future efforts include synthesizing and characterizing the properties of asymmetrical ionic liquids and their binary mixtures.
Synthesis of Imidazolium Ionic Liquids
Presenter: Rahonel Fernandez
Faculty Mentor: Dr. Sharon Lall-Ramnarine
Department of Chemistry

Abstract:

Ionic Liquids (ILs) attract interest from a broad audience owing to their attractive tunable physical properties. Their properties of high conductivity, low volatility, low flammability, high thermal stability and ability to be recycled make them attractive alternative solvents in a myriad of applications. Imidazolium ionic liquids have been studied and characterized; however, there is still a lack of understanding, on the molecular level, of how the interaction of the constituent ions gives rise to the observed physical properties. In this work we have synthesized several imidazolium ionic liquids bearing ether side chains of varying lengths and their alkyl analogues. The halide salt precursors were synthesized by reaction of 1-methylimidazole with the alkyl or alkoxy alkyl halides. Halide salts were then reacted with lithium bis(trifluoromethylsulfonyl)amide (LiNTf2) in water at room temperature. The IL structures were confirmed using H-1 and C-13 NMR and the ILs were characterized for their physical properties.

The Role of Monomer Concentration in the Formation of Porous Poly(o-toluidine) Microspheres
Presenter: Jean Hwang
Faculty Mentor: David M. Sarno
Department of Chemistry

Abstract:

We have developed a simple method to prepare porous microspheres of poly(o-toluidine) (POT), which may be useful as microreactors, scaffolds for catalysis, and capsules for drug delivery. Irregular granular POT is first synthesized by the “rapid mixing” method. Upon addition of excess 4M ammonium hydroxide to the crude product mixture, the granular particles are converted into porous spheres. FTIR spectra and other experimental observations suggest that when the solution is made basic, excess amphiphilic o-toluidine present in the mixture produces a water-in-oil-in-water double emulsion that serves as a “soft template” to form the porous spheres. We have found that the process is highly sensitive to the monomer concentration. According to SEM data, if it is too low, the granules will not be converted into spheres. If it is too high, the resulting material is porous, but it is oily, and composed primarily of continuous slabs or fragmented particles.
Oligofluorene Single Molecule Wires
Presenters: Yi (Jane) Jiang, Jordan Snaider, Francisco Caban, Kyle Bremer
Faculty Mentors: Professor Gina Florio and Professor Sujun Wei
Department of Chemistry, Queensborough Community College;
Department of Chemistry & Department of Physics, St. John’s University

Abstract:

Recent technological advances allow for the fabrication of single molecule electronic circuits. In particular, the Scanning Tunneling Microscopy based Breaking Junction method (STM-BJ) developed in 2003 provides reliable, reproducible generation and measurement of electronic properties of molecular circuits. Inspired by the great performance of polyfluorene in electronic devices, we’ll synthesize and investigate a series of fluorene oligomers’s conductance. The monomer (9,9-dihexyl-9H-fluorene-2,7-diyl)bis(methylsulfane) has been synthesized in a single step. The monomer’s structure was confirmed by H-NMR and C-NMR. The compound’s conductance in 1,2,4-trichlorobenzene solution is around 2.30E-3 G0. Synthesis and study of dimer & trimer of fluorene oligomers are underway.

Nanoparticles and Nanocapsulation for Medical Applications
Presenter: Shuai Ma
Faculty Mentor: Dr. Sasan Karimi
Department of Chemistry

Abstract:

We have previously reported the mechanism of an unusual ring-contraction reaction of 2,4-diphenyl-3H-1-benzazepine to quinoline using NBS. In an effort to establish a general method for this type of ring-contraction, we treated 2,4-diphenyl-3H-1-benzazepine with selenium diox-ide. This reaction ring-contracted to give 2,4-diphenylquinoline, phenyl(3-phenylquinolin-2-yl)methane, and 2-(3,5-diphenylfuran-2-yl)aniline. Moreover, when 2,4-diphenyl-3-methyl-3H-1-benzazepine was treated with selenium dioxide under the same reaction conditions, ring-contraction proceeded to give 3-methyl-2,4-diphenylquinoline and 2,3-diphenylquinoline in yields of 6% and 32% respectively. The mechanisms for formation of all the products above will be presented.
Microwave Synthesis of Magnesium Nanoparticle-Single Walled Carbon Nanotube Composites for Lightweight and High Strength Applications.

Presenter: Furqan Mahmood
Faculty Mentor: Tirandai Hemraj-Benny
Department of Chemistry

Abstract:

Single-walled carbon nanotubes (SWNTs) are graphene sheets, which consist of hexagonally packed carbon atoms, rolled into single tubes at the nanoscale. Due to its superior strength, it is ideal for use in composites and other protective materials. Herein, we propose to incorporate Mg nanoparticles with SWNTs, using a microwave process to produce nanocomposites for strong and lightweight applications, such as for military usage. Magnesium is less dense than aluminum and titanium which are currently used in lightweight applications.

Synthesis and Characterization Of Hafnium (IV) Oxide Coated Single-Walled Carbon Nanotube

Presenter: Sai Yan Qu
Faculty Mentor: Dr. Tirandai Hemraj-Benny
Department of Chemistry

Abstract:

Single-walled nanotubes, SWNTs, (0.7 < d < 2 nm) consists of a single layer of graphene sheet seamlessly rolled into a cylindrical tube. SWNTs, as well as, hafnium (IV) oxide have demonstrated potential electronic applications due to their unique properties. In this study we investigated the chemical interaction of hafnium t-butoxide with SWNTs, which were initially functionalized with hydroxyl groups. The functionalized SWNTs were characterized by Atomic Force Microscopy (AFM), Raman, FT-IR and UV-Vis Spectroscopy.
Synthesis of Pyrrolidinium Liquids

Presenter: Chanele Rodriguez
Faculty Mentor: Dr. Sharon Lall-Ramnarine
Department of Chemistry

Abstract:

Ionic liquids are salts that melt below 100 °C. Ionic liquids have seen applications in many areas and allowed for improvements to many processes where molecular solvents fall short of requirements. There is still a lot to be learned about their structure and properties. In this work we have synthesized pyrrolidinium ionic liquids bearing ether side chains of varying lengths and their alkyl analogues. The pyrrolidinium halide salts were first prepared using both bench top and microwave methods. The structures of the liquids were confirmed using H-1 and C-13 NMR and the water contents were determined using Karl Fischer titration. The pure ILs with water contents below 100 ppm were characterized for their physical properties. This work is part of a larger collaborative project with Dr. Ed Castner at Rutgers University to study the interactions between the ions in ionic liquids and the effect on the observed physical properties.

Properties of Binary Mixtures of Ionic Liquids

Presenter: Emely Rosario
Faculty Mentor: Dr. Sharon Lall-Ramnarine
Department of Chemistry

Abstract

Due to their non-volatility and high conductivity ionic liquids (ILs) are advantageous over common organic solvents. However, the high viscosities of ILs often impede their large scale applications. In this project binary ionic liquid mixtures were designed in order to reduce viscosity. The goal is to reduce viscosity and increase conductivity by mixing ILs together. N-ethoxyethyl-N-methylpyrrolidinium bis(trifluoromethylsulfonyl)amide (P1EOE NTf2) was used as the solvent and ILs containing monocations or dications combined with the same NTf2 anions were used as the solutes. Mixtures containing 10%, 25% and 50% SE6 NTf2 were prepared and characterized. Results indicate that although the viscosities of the binary ionic liquid mixtures are higher than the pure P1EOE NTf2 (53 cP) it is still much lower than the pure SE6 NTf2 (1582 cP) providing access to the dication without the high viscosity. Future work will focus on preparing and characterizing mixtures with varying dications and concentrations.
Partial Sulfonation of Polyaniline Nanofibers

Presenter: Silvia Salamone
Faculty Mentor: Dr. David Sarno
Department of Biological Sciences and Geology

Abstract:
Composites of polyaniline (PANI) nanofibers with gold nanoparticles (Au-NPs) can lead to novel optical and electronic materials. However, since there is no specific interaction between PANI and Au-NPs, loading of the NPs onto the fibers is irregular. Sulfonation of PANI introduces negative charges onto the polymer, which can attract positively charged Au-NPs to increase the extent of NP deposition. However, sulfonation also increases the solubility, which degrades the nanostructure. Partial sulfonation may limit this by leaving the fiber core insoluble while providing sufficient charge at the fiber surface. We have exposed PANI nanofibers to dilute solutions of sodium metabisulfite to incorporate sulfonate groups into the polymer backbone via nucleophilic addition. FTIR spectra reveal new sulfur-oxygen stretches, and SEM supports partial sulfonation by showing a mixture of discrete and fused fibers. Current studies are focused on measuring the extent of sulfonation and on optimizing the method by varying the reaction conditions.

Refractive Index of Adipic Acid Measured by Zoom-In Method

Presenter: Hyo Jung Shin
Faculty Mentor: Jun H. Shin
Department of Chemistry

Abstract:
Recently we have developed a method for determining the refractive index of solid compounds: the zoom-in method. The method was based on the observation that the refractive index of a liquid remains unchanged with the addition of a solid if the refractive index of the solid is the same as the liquid. The method has been adopted to determine the refractive index of adipic acid in two sets of solvent systems: DMSO/THF and DMSO/EtOH. In DMSO/THF solvent system, the refractive index of adipic acid was found to be the same as a 79% DMSO solution in THF, having a refractive index of 1.461(1). The same procedures were repeated with EtOH/DMSO solvent system, and the refractive index was measured as 1.460(1) which was close to the result obtained from DMSO/THF system. The zoom-in method turned out to be a useful system in measuring the refractive index of solid compounds.
Nanoparticles and Nanocapsulation for Medical Applications

Presenter: Nelson Tobar
Faculty Mentor: Dr. Tirandai Hemraj-Benny
Department of Chemistry

Abstract:
Nanoscience is a new and relatively unexplored field of science. It is showing great potential for the advancement of some fields of medicine. Specifically, nanoparticles have unique properties which can help overcome some of the limitations in current techniques used in the medical field, such as for drug delivery, medical imaging, implants and fighting bacterial infections. A promising technique for drug delivery at the nano-scale is nanoencapsulation. Nanoencapsulation is a technique in which nanoparticles are used to form a shell around a material or drug. Herein, we present background information, as well as, a new proposal of utilizing fullerenes for this application. Even though nanoparticles have great potential in medicine they also have harmful side effects that are not yet well understood.

Microwave Synthesis of Single-Walled Carbon Nanotube-Ruthenium Nanoparticles Composites in Ethanol

Presenter: Nelson Tobar
Faculty Mentor: Tirandai Hemraj-Benny
Department of Chemistry

Abstract:
The integration of one-dimensional carbon nanotubes with zero-dimensional nanoparticles into hybrid structures often possess unique structural and catalytic properties that are not available to the respective components alone, and thus, have been envisioned for many applications. Studies have shown that single-walled carbon nanotubes (SWNTs) offer superior electrical, mechanical and catalytic performance over multi-walled carbon nanotubes (MWNTs) due to their smaller and more homogeneous diameter, higher surface area and less defect densities. Herein, SWNTs reinforced with uniform distribution of ruthenium nanoparticles were synthesized by microwave irradiation in ethanol for the first time. A comparative study was done to determine the mechanism of metal nanoparticle formation. The Ru nanoparticle-SWNT composites were characterized by High Resolution Transmission Electron Microscopy (HR-TEM), Energy Dispersive X-ray Spectroscopy (EDS), and UV-Vis Spectroscopy.
Determination of the Refractive Index of Adipic Acid Measured by Extension Method

Presenter: Brian Um
Faculty Mentor: Dr. Jun H. Shin
Department of Chemistry

Abstract:
Based on observations there is a strong linear relationship between the percent mass of solution and its refractive index. Accordingly, the extension method was used to measure the refractive index of solid compounds. Since adipic acid shows good solubility in various organic solvents including DMSO, three other solvents such as ethanol, methanol, and THF were used to determine the refractive index of adipic acid by the extension method. For example, a good linear plot between the refractive index and %mass of adipic acid in DMSO was obtained along with a linear equation (e.g. y=0.000161x + 1.474765). Then a value of 100% was applied to the equation as a concentration variable (x in the equation) to get the refractive index of adipic acid, which was 1.459 (0.000161x100 + 1.474765). After two more trials, 1.460(1) (average of three measurements) was determined as the refractive index of adipic acid in DMSO.
Ducci’s K-Numbers Problem
Presenter: Adebisi Adewole
Faculty Mentor: Dr. Karan Puri
Department of Mathematics & Computer Science

Abstract:

Ducci’s k-numbers problem (also known as the k-numbers game) is an iterative process where beginning with a sequence of k-numbers, the next sequence is obtained by taking the absolute difference of neighbors in the sequence. We discuss this problem with special attention to the case k=4. This provides us with sufficient complexity to illustrate the breadth of this problem. We analyze the conditions under which the game ends and establish a bound on the length of the four-numbers game. We then consider k-numbers games and discuss some results on the length of these games.

Eminence in Mathematics: Leonhard Euler, and Several Problems of Interest
Presenter: Juan Javier Arcenas
Faculty Mentor: Dr. Howard Sporn
Department of Mathematics & Computer Science

Abstract:

Leonhard Euler, an eighteenth century Swiss mathematician, is considered to be one of the greatest mathematicians of all time. The sum total of his extremely prolific body of work encompasses numerous fields, including mathematical analysis, graph theory, number theory, and much more. This presentation will feature a brief biographical sketch, and focuses on a few particular problems of interest on which he managed to find creatively brilliant solutions, in order to highlight his uniqueness as a preeminent figure in mathematics. Investigations include his solution to the Basel problem, his approach to the "Seven Bridges of Königsberg" problem, and an examination of a famous mathematical identity named after him, involving e, i, and p.
Intricacy within Numbers: Multiplicative Order, Primitive Elements, and the Patterns to be Found
Presenter: Juan Javier Arcenas
Faculty Mentor: Dr. Yusuf Gurtas
Department of Mathematics & Computer Science

Abstract:
Number theory is a field that may seem much simpler than it actually is, lacking a large amount of the intimidating symbols and notation common to other fields that shy away the layman observer. This presentation involves a mere sample of a few assorted concepts within the field of number theory, demonstrating that it is an area of study with far more depth and complexity than one may initially assume. The concept of multiplicative order will be introduced, followed by the closely related concept of a primitive element, which has notable applications to the field of cryptography. This presentation is chiefly concerned with methods of finding primitive elements given a certain sample of numbers.

The Prisoner’s Dilemma
Presenter: Joong Ho Cho
Faculty Mentor: Dr. Howard Sporn
Department of Mathematics and Computer Sciences

Abstract:
The Prisoner’s Dilemma is a scenario in the branch of mathematics called game theory. It shows that two individuals might not cooperate even though it is in their interests to do so. I will be going over the history of Prisoner’s dilemma, the theory, and how it affects us today.

A look at Race, Class, and Policing in our Communities
Presenter: Tiana Freeman
Faculty Mentors: Dr. Maria Mercedes Franco
Department of Mathematics and Computer Sciences

Abstract:
Highly controversial deaths of young black men in encounters with law enforcement have reminded the nation that the race-crime relationship continues to be a politically sensitive one. Curious about the policing practices in our community, a criminal justice student is using statistics to take a closer look at some of the “best” and “worst” public schools in NYC, the communities they serve and their interactions with police. What can be said about youth of color in NYC and the quality of schooling and policing in their neighborhoods?
C++ Implementations of Inverse Matrices
Presenters: Seong Ju Ham, Danny Philantrope
Faculty Mentor: Dr. Kwang Hyun Kim
Department of Mathematics and Computer Science

Abstract:
In this presentation, we will introduce a C++ program which finds an inverse matrix, which is very useful for many science and engineering area. This project will focus on the different approaches of calculating inverses, using QR and LU Decomposition. Using our program, we will do the performance test with large set of random matrices and compare with the classical methods like Gauss-Jordan elimination.

Comparison of a Mount and Structure of Iron in Different Plants
Presenter: Krystal Lee, Clarence Ma
Faculty Mentor: Dr. Sunil Dehipawala
Department of Physics

Abstract:
Iron is an essential nutrient not only for humans, but also for all types of plants. Plants use iron for chlorophyll formation, RNA metabolism, and transpiration process regulation. Iron is one of the most abundant metals in the soil and occurs in a wide range of chemical forms. Humans receive iron through meat (Heme-iron) products and plants (non-Heme). Non meat eaters depend on plants for their iron. Almost all green leafy vegetables contain iron. But amount of iron per gram of leave is different in different plants. Also the atomic structure may differ from a plant to plant. X-ray absorption spectroscopy (XAS) is a valuable tool to determine the amount of iron present in a particular sample and atomic structure around the iron atom. Results obtained from different plant tissue samples will be presented.

On the Digits of the Mega and Mega-like Numbers
Presenter: Adolfo Martinez
Faculty mentor: Dr. Daniel Garbin
Department of Mathematics and Computer Science

Abstract:
In this research project we will investigate extremely large numbers such as mega. In light of this we may consider a more modest goal: If we could not compute, nor store all the digits of mega, could we at least compute and store some of the digits? Awhile ago, the student investigator wrote a program to do just that, succeeding in computing the last 14 digits of mega. The method however was very computationally expensive both time and memory wise. Our goal is to develop more
efficient ways to compute many more digits of such extremely large numbers, by using both number theoretical methods as well as computers in a laboratory.

**Phase Response Curves in Determining the Activity of Neuronal Networks**  
**Presenter:** Jeff Massena  
**Faculty Mentor:** Dr. Zeynep Akcay  
**Department of Mathematics and Computer Science**

**Abstract:**

The behavior generated by a small neuronal network depends on the firing phase relations of its neurons. A tool that is used to determine the phase relation in a neuronal network is the Phase Response Curve (PRC). The PRC measures the response of a firing neuron to a given stimulus. First, we use analytical and numerical methods to obtain PRCs for the Quadratic Integrate and Fire (QIF) neuron model. Next, we study how PRCs have been used to determine the activity of networks of neurons. Finally, we do simulations of a network of two QIF neurons and compare the resulting phase relation obtained from simulation with the one obtained from a map that makes use of PRCs.

**Examination of Structural Properties of Iron Particles in Volcanic Ash through X-ray Absorption Spectroscopy**  
**Presenter:** Wilson Nieves  
**Faculty Mentor:** Dr. Sunil Dehipawala  
**Department of Physics**

**Abstract:**

Kilauea is one of the world's most active volcanoes. The volcano has been in constant eruption since 1983. Over the past several years, after a large collapse in November 2005, the summit of Kilauea volcano has had a rather unusual eruption that has produced a significant amount of tephra (rock expelled from volcanoes). While the compositions of the glasses have been carefully studied, there is a variety of remarkable coatings of whitish to pinkish minerals that form, when the tephra reacts with the volcanic gasses in the vents. These materials contain a significant amount of iron particles. Structure of these particles was studied using EXAFS and XANES experiments. According to preliminary analysis, several amounts of iron particles are present in the samples collected from the different distances from the vent. The normalized intensity of the pre-edge feature appears in the XANES region displaying different results. This indicates that the oxidation state and symmetry around the iron particles vary in different regions.

**Turing Machine**  
**Presenter:** Nitika Pandey  
**Faculty Mentor:** Dr. Whanki Lee  
**Department of Mathematics and Computer Sciences**

**Abstract:**
In this presentation I will demonstrate a Turing machine that determines who wins a game of Tic Tac Toe: player 1, player 2, or draw. A Turing machine is a hypothetical device that manipulates symbols on a strip of tape according to a table of rules. A Turing machine can be adapted to simulate the logic of any computer algorithm, and is particularly useful in explaining the functions of a CPU inside a computer.

**Solutions to the Schrödinger Equation As They Evolve Over Time**

**Presenter:** Arthur Rozario  
**Faculty Mentor:** Dr. Andrew Bulawa  
**Department of Mathematics and Computer Science**

**Abstract:**  
Erwin Schrödinger, an Austrian Physicist, formulated the Schrödinger equation. This is a partial differential equation that describes how a quantum state changes in time. A solution to the Schrödinger equation, called a wave function, describes the quantum state of a particle. For example, the squared modulus of the wave function is the probability density for the position of the particle, and by integrating the density function it determines the probability of finding the particle in a given region. One of the parameters of the Schrödinger equation is the potential function. The aim of this research project is to study properties of wave functions with respect to various potential functions. Fourier series are used to solve the Schrödinger equation and Maple is utilized to plot numerical approximations of the wave functions as they evolve over time.

**Investigation of Chemical Nature and Distribution of Iron within a Plant**

**Presenter:** Rahel Steffen  
**Faculty Mentor:** Dr. Sunil Bhaskaran  
**Bronx Community College, Department of Physics**

**Abstract:**  
Spinacia oleracea or commonly named as spinach is a well known plant that contain iron. The amount of iron present in different parts of the plant and chemical environment of iron atoms is not known precisely. Iron present in this plant was investigated using X-ray absorption spectroscopy (XAS). Tissue samples collected from different regions of a plant was dried at 200°C grinded to fine powder form. X-ray absorption spectra of samples were collected at the National Synchrotron Light Source of Brookhaven Laboratory for the energy range of 6900 to 8100eV. The main absorption peak of the absorption spectrum is proportional to the amount of iron present in the sample. According to the data most mature leaves contains highest amount of iron. Most of the iron present in the samples has the form Fe³⁺ or electron density at the site of the iron nucleus similar to
AllaKing Pharmaceutical Company
Presenter: Irene Sun
Faculty Mentor: Dr. Carolyn King
Department of Mathematics and Computer Science

Abstract:
Donepezil is the generic name for Aricept, an oral medication used to treat dementia related to Alzheimer’s disease. It belongs to a class of drugs called cholinesterase inhibitors and was approved by the FDA in 1996. Although memory, awareness and functional abilities may improve while taking this medication, Donepezil does not directly cure Alzheimer’s disease. The drug’s chemical processes will be presented along with hypothesizing whether the production and storage in a new chemical plant by AllaKing Pharmaceutical Company meets the current (good manufacturing practices) GMP. Statistical analyses of collected real data will also be presented.

Investigation of Chemical Nature and Distribution of Iron within a Plant
Presenter: Rahel Steffen
Faculty Mentor: Dr. Sunil Bhaskaran
Bronx Community College, Department of Physics

Abstract:
Spinacia oleracea or commonly named as spinach is a well known plant that contain iron. The amount of iron present in different parts of the plant and chemical environment of iron atoms is not known precisely. Iron present in this plant was investigated using X-ray absorption spectroscopy (XAS). Tissue samples collected from different regions of a plant was dried at 2000C grinded to fine powder form. X-ray absorption spectra of samples were collected at the National Synchrotron Light Source of Brookhaven Laboratory for the energy range of 6900 to 8100eV. The main absorption peak of the absorption spectrum is proportional to the amount of iron present in the sample. According to the data most mature leaves contains highest amount of iron.

Tiling Properties of Symmetric Bodies and Shapes
Presenter: Ting Wei Zhao
Faculty Mentor: Azita Mayeli
Department of Mathematics and Computer Science

Abstract:
Tiling theory is an elegant branch of mathematics that has applications in several areas of computer science. The most immediate application area is graphics, where tiling theory has been used in the contexts of texture generation, sampling theory, and of course the generation of decorative patterns. In this project we propose to study the tiling property of symmetric convex bodies, such as rectangles, hexagons, trapezoidales, and find the lattice points such that the translations of the convex body under the lattice points can cover the whole space. More precisely we studied and investigated the following problem: For any given symmetric convex body with center on the origin of the x-y-axis, find a countable set of the pairs (a,b) such that the translations of the body by the lattice points (a,b) are disjoint (up to the edges) and such that all translations of the body cover the plan. Methods we used to solve the problem is the matrix theory methods.
Genome Analysis of Bacteriophage Smeadley

Presenter: Maria Anaya, Wilson Nieves
Faculty Mentor: Dr. Urszula Golebiewska
Department of Biological Sciences and Geology

Abstract:

Bacteriophages are viruses characterized for infecting and replicating within bacteria, these viruses enclose genetic material, DNA that can contain several or hundreds of genes. Mycobacteriophages that infect mycobacteria are classified in clusters according to similarities on their genome; parts of this genome may be found in different phages with different arrangements, creating a close relation across bacteriophages. Mycobacteriophage Smeadley was found in soft soil in 2011. Since then, Smeadley has been completely sequenced, the 52392bp found, allowed researchers to analyze Smeadley’s genome and predict its genes and protein functions. This work presents the nucleotide analysis of 6600bp using bioinformatics techniques. Software and online databases such as DNA Master, NCBI Blast, and HHpred, were used to identify eleven genes, their length, sequence, related bacteriophages, and the possible proteins and functions these genes may encode. The analysis of a part of Smeadley’s genome indicated the presence of 11 genes each of them having mycobacteriophage Astro as the closest relative. We will discuss predicted functions of several predicted proteins.
Analysis of Genes 17-23 of Mycobacterium phage Smealley

Presenters: Brigett Carvajal, Wesbee Victor
Faculty Mentor: Dr. Urszula Golebiewska
Department of Biological Sciences and Geology

Abstract:

Gaining a deeper understanding of viruses is necessary for all life. Identifying a specific viruses purpose and its intentions can help lead to finding their structure, classification and possibly how they have evolved. Viruses lead a borrowed life. In essence it is necessary to realize that all of its components have a purpose. Once a virus finds its target host it will take over.

The Mycobacteriophage given to be analyzed was called Smealley. Genes 17 through 23 was analyzed. Gene 17 and 20 had possible functions that are necessary for a virus. Gene 17’s possible function was Topoisomerase I. Topoisomerase I would be helpful for a virus to encode its own DNA (or nucleic acid) via replication, transcription and chromosome segregation in the host cell. Gene 20’s possible function was Apolipoprotein AI. This protein would be beneficial for a virus because it can help the virus navigate into the host cell.

Among the genes analyzed the most common relatives noted were Fredward and Astro, other relatives identified were Fredward 21 and Saintus. Two out of the six genes analyzed gene 20 and 23 had Astro as their common relative. Moreover, gene 17 and 21 were closely related to Fredward. Gene 19 was related to Fredward 21 and Finally, Gene 18 and 22 had Saintus as their common relative. These results make sense due to the fact that most of the common relatives stated are part of the same Subcluster A8. It was also noted using the help of the Mycobacteriophage Data Base that most of these common relatives were discovered around the same time 2010-2011.

It was also discovered that most of these Bacteriophages were found in the same type of environment. All of the common relatives found were all discovered in moist soil and mild weather.
Assigning Functions to Predicted Genes in Mycobacterium Phage Smeadley

Presenter: Yueli Chen, Yizhu Jin  
Faculty Mentor: Dr. Urszula Golebiewska  
Department of Biological Sciences and Geology

Abstract:

We investigated portion of the genome of Mycobacterium phage Smeadley. Smeadley was found by Krystle McMinn in 2011, was fully sequenced and graciously donated to us. The genome of Smeadley has 52392 base pairs. Our group focused on the first segment of the genome, nucleotides 1-6600, which includes 8 predicted genes. We used BLAST and HHPRED programs to analyze these genes and predict their functions. Here we will discuss possible functions of some of the proteins including Tail Protein, Terminase, Lysin A and Lysin B. Since Lysin A and Lysin B are essential for lysis of Mycobacterium, we will discuss possible mechanism of lysis by phage Smeadley.

Identification of Microbial Types that may Exist in a Biology Laboratory of QCC

Presenter: Claudia Duran Garcia  
Faculty Mentor: Dr. Mangala Tawde  
Department of Biological Sciences and Geology

Abstract:

This project aims to identify and assess the diversity of urban microbial communities and how it may affect human health. We are using 16s rRNA sequencing to identify species of bacteria that exist in various environments on QCC campus. We swabbed few areas such as laboratory corners and sink in QCC’s Biology laboratory room M 229 to collect bacteria samples and extracted genomic DNA from them. We are sequencing the genomic DNA for 16s ribosomes by Next Generation Sequencing (NGS) method. We will use the sequencing data to identify bacterial species found in Gymnasium areas and other areas around the campus to compare the microbial communities. We aim to understand how the dynamics of the bacterial communities differ from place to place and whether these differences can influence human health in urban settings.
Identifying Types of Bacteria Found in QCC Cafeteria

Presenter: Estefania Fonseca  
Faculty Mentor: Dr. Mangala Tawde  
Department of Biological Sciences and Geology

Abstract:

This project aims to identify and assess the diversity of urban microbial communities and how it may affect human health. We are using 16s rRNA sequencing to identify species of bacteria that exist in various environments on QCC campus. We swabbed few areas such as coffee machines and dining tables in QCC’s Students and Staff Cafeteria to collect bacteria samples and extracted genomic DNA from them. We are sequencing the genomic DNA for 16s ribosomes by Next Generation Sequencing (NGS) method. We will use the sequencing data to identify bacterial species found in Gymnasium areas and other areas around the campus to compare the microbial communities. We aim to understand how the dynamics of the bacterial communities differ from place to place and whether these differences can influence human health in urban settings.

DNA Polymerase

Presenter: Farah Gedeon  
Faculty Mentor: Dr. Urszula Golebiewska  
Department of Biological Sciences and Geology

Abstract:

DNA? RNA? Protein is a path that is similar to every organism living on earth, they all have the same mechanism when it comes to handle genetic information but what about a virus which we cannot classify as a living organism as it is missing most of the properties of life. Viruses are just pieces of genetic material inside a protein coat. Scientists describe them as organisms that “lead a borrowed life” which means that they take other organisms as hosts to have a life like theirs. Bacteriophages are viruses that infect bacteria. Their genetic information is composed of a piece of DNA enclosed in a capsid composed of proteins. We investigate Mycobacterium phage Smeadley and were assigned a piece of DNA with 20 genes. From gene 46 to 65, only gene 57 had a possible function, DNA primase. DNA primase is required for DNA replication as DNA polymerase is an enzyme that needs to join the first DNA nucleotide with RNA primer. This means that DNA primase is very important for a bacteriophage replication, it is somewhat surprising that a virus would carry own primase and not relay on primase present in the host.
Identification of Types of Bacteria that Exist in QCC Gymnasium Walking Machine & Hire Brisbane

Presenter: Marleny Guzman
Faculty Mentor: Dr. Mangala Tawde
Department of Biological Sciences and Geology

Abstract:

This project aims at identifying and assessing the diversity of urban microbial communities and how it may affect human health. We are using 16s rRNA sequencing to identify species of bacteria that exist in various environments on the QCC campus. We swabbed a few areas such as walking machine and Hire Brisbane in QCC’s Gymnasium to collect bacteria samples and extracted genomic DNA from them. We are sequencing the genomic DNA for 16s ribosomes by Next Generation Sequencing (NGS) method. We will use the sequencing data to identify bacterial species found in Gymnasium areas and other areas around the campus to compare the microbial communities. We aim at understanding how the dynamics of the bacterial communities differ from place to place and whether these differences can influence human health in urban settings.

Analysis of Predicted Genes 31 – 46 of Mycobacteriophage Smeadley

Presenter: Ana Hernandez, Niki Patel
Faculty Mentor: Dr. Urszula Golebiewska
Department of Biological Sciences and Geology

Abstract:

During the spring 2015 semester our class analyzed genome of Mycobacteriophage Smeadley. DNA master in conjunction with BLAST and HHpred were used for functional gene annotations. DNA master is a platform that bundles gene prediction programs such as Glimmer, GenMark and Aragorn as well as BLAST. Specifically Glimmer program was used to predict the coding potential of open reading frames (ORFs). The GenMark provided similar functionality to Glimmer and was used to predict genes. The Aragorn was used to find tRNAs and tmRNAs. It is convenient for gene annotations as outputs from various programs are accessible from one place. We focused on putative genes 31 to 46. In our sections all of the genes were in reverse direction. Most of them had genes from either Astro or Saintus as their closes relatives, similarly to the rest of the genome. Only few genes had well defined predicted functions, they included DNA binding and processing. For example, gp41 is a potential DNA polymerase, gp43 contains HTH DNA binding domain and gp46 is a potential ribonucleotide reductase.

We will discuss in more detail function of these proteins in the relation to viral life cycle.
Mycobacteriophage Genome
Presenter: Weijin Gu, Sung Min Jung
Faculty Mentor: Dr. Urszula Golebiewska
Department of Biological Sciences and Geology

Abstract

A Mycobacteriophage refers to bacteriophage that infects mycobacterial host. In this particular research, genome of Mycobacteriophage called Smeadley which has 52,392bp was analyzed and putative functions of genes were assigned and interpreted. We used program called DNA master that bundles several other programs to predict and compare genes. Due to large size of the genome, it was divided evenly amongst the class and we analyzed base pairs between 19801 and 26401. In this section, we were able to find 10 potential genes, labeled 22 to 33. Out of genes that we analyzed, 70% had putative functions, and the rest 30% did not show any putative functions. Putative functions included minor tail protein, portal protein, integrase, recombinase, excisionase – Xis, DNA binding domain, deoxycytidylate deaminase, and cytidine deaminase. The section of genome that we analyzed is located right in the middle and contained mixture of functional and structural proteins. Many functions are related to rebinding and tail protein. The one that we are interested in is the potential coding of minor tail protein. The tail of Mycobacteriaphage is one of important structural components. Therefore we examined the minor tail protein in more detail.

Preliminary Steps to Elucidate the Role of Streptomyces rhomboid Proteins
Presenter: Wilson Nieves
Faculty Mentors: Dr. Monica Trujillo, Dr. Naydu Carmona
Department of Biological Sciences and Geology

Abstract:

Streptomyces are gram-positive soil bacteria characterized by a complex developmental cycle and by the production of secondary metabolites, both processes involving multiple cell-to-cell communication pathways. These natural products are important for human health as they account for more than 50% of the naturally-available antibiotics; others are differentiation inducers, apoptosis inhibitors, and antitumor compounds. Rhomboids are intramembrane proteases with their active site located within the cell membrane. These enzymes are found in all branches of life and have a wide range of biological functions loosely associated with cell signaling. Our hypothesis is that Streptomyces rhomboids could be involved in cellular communication.

As Streptomyces coelicolor is the model organism for the study of the Streptomyces genus, preliminary experiments to complement a well characterized bacterial rhomboid null mutant with S. coelicolor rhomboid genes are described in this proposal.
To Investigate what Species of Bacteria Exist on QCC Students’ Cellphones

Presenter: Kristopher Parente
Faculty Mentor: Dr. Mangala Tawde
Department of Biological Sciences and Geology

Abstract:

This project’s aim is to identify and assess the diversity of urban microbial communities and how it may affect human health. We are using 16s rRNA sequencing to identify species of bacteria that exist in various environments on QCC campus. We swabbed some of the QCC students’ cell phones to collect bacteria samples and extracted genomic DNA from them. We are sequencing the genomic DNA for 16s ribosomes by the Next Generation Sequencing (NGS) method. We will use the sequencing data to identify bacterial species found in Gymnasium areas and other areas around the campus to compare the microbial communities. The purpose is to understand how the dynamics of the bacterial communities differ from place to place and whether these differences can influence human health in urban settings.

Evolutionary Relationship with Smeadley

Presenter: Tarric Sookdeo, Sai Yan Qu
Faculty Mentor: Dr. Urszula Golebiewska
Department of Biological Sciences and Geology

Abstract

Bacteriophages are a unique and very diverse group of viruses which infect bacteria. In our research, we studied and analyzed a genome of a bacteriophage known as Smeadley. Smeadley contains 52,392 base pairs of genetic information. Our group was assigned to analyze the last segment of the genome, genes 83 to 99. When comparing gene’s predicted in Smeadley to genes in Gene Bank we kept on finding that the bacteriophage was strikingly similar to two other strains of bacteriophages, Mycobacteriophage Astro, and Mycobacteriophage Saintus. When we looked even closer, we found that all 3 of these bacteriophages were discovered around the same region in Southeast America. As a result of this, all 3 strains live in the same environment which happens to be moist and warm. The genetic similarity could very well be due to one strain evolving from another which eventually formed into 3 distinct strains, one of them being Smeadley.
Mycobacteriophage Smedley

Presenter: Nelson Tobar, Tanzina Islam
Faculty Mentor: Dr. Urszula Golebiewska
Department of Biological Sciences and Geology

Abstract:

Bacteriophages are viruses that infect bacteria. Bacteriophages inject their genome into the infected bacteria causing them to produce large number of viral particles. Some of the bacteriophages undergo lysogenic cycle, they incorporate their genomes into bacterial chromosome. Bacteriophages can lead to genetic transduction, shuttling genes between bacteria. The study of bacteriophages is important given that due to their capability to change the genome of bacteria, they can make bacteria produce proteins that they were not able to produce before the infection, but also they can acquire new properties like drug resistance. The bacteriophage that was studied in this project was Mycobacteriophage Smedley. We analyzed genes sixty-three to seventy-eight. All of the studied genes were in reversed direction. The data collected with regards to the function of the genes studied were not conclusive, indicating that these are novel genes with functions yet to be discovered. In ten out of the fifteen genes of the studied bacteriophage had one-hundred percent similarity and one-hundred alignment with a gene belonging to another bacteriophage called Saintus. The other 5 genes had one-hundred percent similarity and one-hundred alignment with a gene belonging to a bacteriophage called Astro.

The Effect of Abnormal Calcium levels in Muscle Activity

Presenter: Karol Trejo
Faculty Mentors: Dr. Sharon Ellerton and Dr. Naydu Carmona
Department of Biological Sciences and Geology

Abstract:

Intracellular calcium ion concentrations play an important role in the physiology of muscle action. There are several mechanisms that regulate the levels of this ion in muscle fibers during excitation and relaxation. An abnormal change in the intracellular Ca2+-concentration can result in defective muscle contraction and/or relaxation. This Honors project investigates how disruption in calcium ion homeostasis can result in diseases like Malignant hyperthermia (MH) and Central core disease (CCD). I will provide a general overview of the muscular system in a workshop to children from the Saratoga Inn. I will emphasize the importance of calcium in muscle activity and health.
Fed Challenge Jeopardy

**Presenters:** Ayesha Alii, Juan Javier, Arcenas, Nadine Balkaran, Najee Ben, LiJuan He, Omaar Lewis, Dominik Witkowski, Catherine Zanca

**Faculty Mentors:** Dr. Edward Hanssen, Professor Ben Murolo

**Department of Business**

**Abstract:**

The Fed Challenge is a nationwide intercollegiate competition sponsored by the regional Federal Reserve offices. Each Fall the team competes against 30 colleges in the New York City competition. This spring the team decided to prepare for the competition by developing a Fed Challenge Jeopardy game with topics covering monetary policy and economic conditions.

Demonstrations of Portions of a Mock Trial Case

**Presenters:** Kyle Chin-How, Sylvia Diyarza, Jonathan Escutia, Odessa Harper, Tajia Kelly, Jennisa Lopez, Nicolas McDonald, Michael Rawls, Shanya Mc Cleary, Shaniece Walker

**Faculty Mentors:** Professors Ted Rosen, Leslie Francis, Elaine Thompson, Kelly Ford

**Department of Business**

**Abstract:**

This year for the eighth consecutive year, Queensborough Community College’s Mock Trial Team competed in the American Mock Trial Association's national competition, in which approximately 600 teams from more than 350 colleges and universities throughout the country (including only approximately 4 two year colleges) competed by trying the same case, a civil, wrongful death case brought by the parents of an eleven year old child tragically shot and killed by another eleven year old child. The parents of the victim sued the parents of the child who did the shooting. Students competed by serving as lawyers or as one of eleven possible witnesses. Team members presented open and closing statements, introduced evidence, asserted objections to offered evidence, conducted direct and cross-examinations and role-played as witnesses in mock trials in which panels of three volunteer lawyers or law students presided as mock judges.

During the Honors Conference, members of the QCC Mock Trial Team will demonstrate open and closing statements and direct and cross-examination.
An in-depth look at the steering system of a SAE Formula 1 Race Car
Presenter: Naim Rashid
Faculty Mentor: Professor Darryl Williams
Department of Engineering Technology

Abstract:

In this project I designed the steering mechanism which was to be a push-pull steering type system. The Push-pull steering is the standard and perhaps most recommended method of using a steering wheel to point the car in a specific direction. The method allows the driver to sit in a better position, with a better grip of the wheel and smoother turning. It’s also regarded as safer than other steering styles. The solid works CAD software was used to design and test this steering system.

Accounting Case Competition "Lax Procedures at National Capital Trust"
Presenters: Lawrence Maitland, Mahamadou Dembele, Minseo Kim, Daniel Deonarine
Faculty Mentor: Professor Shele Bannon
Department of Business

Abstract:

Team conducted research on Internal Controls, Risk Management, Fudiciary Responsibilities, Ethical responsibilities and Fraud and then analyzed the Institute of Management Accounting Student Case - "Lax Procedures at National Capital Trust". As the Audit Committee, they met with the head of the Finance Department to discuss their investigation of apparent anomalies and make necessary changes. The end result is a 15 minute video submission.

The Design and Use of a Double Wishbone Control Arms used in a SAE Formula 1 Race Car
Presenter: Antonio Ayala
Faculty Mentor: Professor Darryl Williams
Department of Engineering Technology

Abstract:

Formula S.A.E. is a competition amongst colleges to engineer and design a formula one style race car. The competition is judge on all aspects from cost, to vehicle performance. In my presentation I will be focusing how I designed the double wishbone control arms. The CAD program SolidWorks was used to create and test the structure under various applications. By utilizing SolidWorks I was able to develop a detailed front and rear wheel support system. I hypothesize that the double triangular design it can be provide a stable connection from the frame to the wheel upright. This design will demonstrate our understanding the dynamics of an open wheel race car, and importance of specific flexibility in suspension systems.
An In-depth Look at the Purpose and the Design of the Wheel Upright on a SAE Formula 1 Race Car  
**Presenter:** Joaquin Benalcazar  
**Faculty Mentor:** Professor Darryl Williams  
**Department of Engineering Technology**

**Abstract:**
Formula SAE is a technical design competition organized by SAE International. Each student team designs, builds and tests a prototype based on a series of rules whose purpose is both to ensure safe onsite event operations and promote clever problem solving. In this presentation I will be discussing the design of the wheel upright and the purposes of why this part is needed for the car design. Using the CAD program SolidWork, I was able to design a wheel upright that I best believe would benefit the car design and help us win the competition.

A Deeper Look into the Frame of a SAE Formula 1 Race Car  
**Presenters:** Jhordan Flores  
**Faculty Mentor:** Professor Darryl Williams  
**Department of Engineering Technology**

**Abstract:**
The Formula SAE series is a design competition between colleges across North American and the goal is to engineer and design a formula I style race car. Term of students must design, build and test a prototype based on a series of rules and road restrictions set by SAE international. This presentation will explain how the frame is the main supporting structure of a motor vehicle and all other components are attached, comparable to the skeleton of an organism. To design and test virtually the frame we will use the CAD software called solid works. Our goal is to be as efficient as possible both aerodynamically and weight wise, while also adhering to the rules set by SAE.

Race Car Engineering  
**Presenter:** Keith Kratchel  
**Faculty Mentor:** Dr. Shahadat Hossain, Professor Darryl Williams  
**Department of Engineering Technology**

**Abstract:**
Formula S.A.E. is a competition amongst colleges to engineer and design a formula style race car. The competition is judged on all aspects from production cost, to vehicle performance. In my presentation I will be focusing on engineering an efficient suspension system focused on high performance turns. This car will be designed with a push rod suspension consisting of shocks, springs, double wishbone control arms, as well as an anti-roll bar for high performance turning. The complete suspension system will be generated on “Solidworks” accompanied with free body diagrams showing all forces acting on the system. This project gives us great insight on the automotive industry starting from an idea to a finished product with the aim to sell a product.
Sickle Cell Anemia Detection Using Southern Blot

**Presenter:** Czarina Calicdan  
**Faculty Mentor:** Dr. Nidhi Gadura  
**Department of Biological Sciences and Geology**

**Abstract:**

Southern Blotting method uses specific fluorescent, luminescent, or radioactively probe to detect a specific DNA of interest. DNA first needs to be run through gel electrophoresis and is then treated with HCl and NaOH to make it single stranded. In this experiment, three sample DNA were tested. Sickle cell anemia is a recessive disorder. It happens due to a point mutation which is within the MstII restriction site. This creates a Restriction Fragment Length Polymorphism pattern. We hypothesize that if two carriers mate then they have 25% chance of having a homozygous normal child and 50% chance of having a heterozygous normal child and 25% chance of having a sick child. Samples were run on a gel, made single stranded and transferred on a nylon membrane. Then they were probed to see the genotypes of the family. Results will be discussed.

Southern Blotting Analysis and the Detection of Sickle Cell Gene

**Presenter:** Christopher Chin  
**Faculty Mentor:** Dr. Nidhi Gadura  
**Department of Biological Sciences and Geology**

**Abstract:**

Sickle Cell Anemia is a serious condition that affects a lot of people. It is a recessive genetic disorder. Biotechnology provides us the tools to understand sickle cell anemia and see the genotype of the person. This experiment, we used southern blotting technique to see the genetic makeup of a person. A point mutation can be the cause of sickle cell anemia. Southern blotting can be used to identify the MstII restriction enzyme pattern of an individual. I hypothesize that if a person is normal we will see both alleles run fast on a gel, however, if a person is sick the bands won’t be cut by MstII therefore run slow on the gel while a carrier for the disease will show a two band pattern. Simulated samples from two parents and their child is run on a gel, then transferred to nylon membrane and probed by blue blot. Results will be explained in the presentation.
Detecting Exposure to Disease by ELISA
Presenter: Paula Delos-Reyes
Faculty Mentor: Dr. Nidhi Gadura
Department of Biological Sciences Geology

Abstract:

The Enzyme-linked Immunosorbent Assay (ELISA) is a commonly used format for serologic testing. When an individual is exposed to a disease, the body’s immune system initiates a response through molecules known as antigens. Because it produces such rapid results, ELISA can test for multiple purposes such as pregnancy, detection of illegal substance use, and disease detection in individuals. In our experiment, Direct ELISA was performed in which given samples were tested and compared to a concentration control of both positive and negative results. We coated the 96 well plate with antigen samples, then we put patient samples which was followed by a secondary antibody to amplify the signal and enzyme linked color changes were detected by a microplate reader. Concentrations provided answers to questions pertaining to the detection of antibodies circulating throughout the blood and if the individual had been or is currently exposed to a specific disease.

Effects of Permethrin exposure on Microglia, Implications of Neurodegenerative Diseases Presenters: Farah Gedeon, Maria Entezarii Faculty Mentor: Mohammad Javdan
Department of Biological Sciences and Geology

Abstract:

Permethrin is an insecticide most frequently used as a pesticide. Microglia are the resident macrophages of the brain and act as the main immune defense in the central nervous system (CNS). Over-activation and functional impairment of microglia have been well studied in developing AD and PD. Therefore, we hypothesized that dysfunction of microglial cells could link the development of AD and PD to the pesticide exposure. To test our hypothesis, we treated BV2 microglial cells with different concentrations (1, 5µg/ml) of Permethrin for 24 hours. There were significant differences between cell viability and also phagocytotic activity of microglia in control groups and two concentrations of permethrin. These data help us to clarify the role of pesticides as environmental risk factors in the genesis of neurodegenerative diseases and understand the particular molecular mechanisms that are involved in neurodegeneration and pesticide exposure.
Tracing Dimorphic Alu Elements in the Human Chromosome 16 PV92 Locus Using DNA Fingerprinting

Presenter: Bharti Kumari
Faculty Mentor: Dr. Nidhi Gadura
Department of Biological Sciences and Geology

Abstract:

Since 1984, the discovery of DNA Fingerprinting by Alec Jeffreys has revolutionized the forensic science field. DNA Fingerprinting is applied towards human identification and the study of population genetics. By studying SINEs such as retrotransposons Alu element, geographical distributions can be analyzed. Specifically, by using dimorphic Alu insertion found on PV92 locus, which is on the human chromosome sixteen, can help identify variation. The hypothesis is that students from various regions of the world would show different dimorphic Alu patterns. Using cheek cells from various students, DNA was amplified at the PV92 locus with Polymerase Chain Reaction (PCR). Thereafter, the PCR products were analyzed using Gel Electrophoresis to determine each student’s genotype. Subsequently, comparisons were conducted between individual’s resulting DNA polymorphisms. The findings indicate that student’s dimorphic Alu elements varied among each other. More importantly, evolution can be further understood by tracing footsteps of Alu elements.

Determining Bacterial Diversity among Urban Microbial Communities Using Metagenomics

Presenter: Bharti Kumari
Faculty Mentor: Dr. Joan Petersen
Department of Biological Sciences and Geology

Abstract:

Metagenomics is a technique that uses genomic sequence data to determine community composition, bypassing the need for isolation and cultivation of individual microbial species. This technique was recently used in the Pathomap study to determine the microbial composition of NYC subway stations. The purpose of this experiment uses metagenomics to determine the community composition of microbes found in various regions of the QCC campus. Samples were collected with cotton swabs, and metagenomic DNA was isolated and quantified. A region of the 16S rRNA gene, found in all bacterial species, was amplified by PCR, and PCR products were analyzed using gel electrophoresis. The amplicon was submitted for next generation sequencing (NGS). Sequence data will be analyzed to determine which bacterial species were present in our samples and the relative abundance of different taxonomic groups. This project will reveal important information about the distribution of microbes found at QCC.
Webbing of the Species: Using DNA Sequencing Analysis to Link a Sequence between Organisms

Presenter: Jhamar Miller
Faculty Mentor: Dr. Nadura Gadura
Department of Biological Sciences and Geology

Abstract:

DNA Sequencing enables us to perform a thorough analysis of DNA. With this knowledge we can make comparisons between homologous genes across species. Though the sequence may be the same across species we hypothesize that there may be differences in functionality. The function will not be the same across the species due to the introns and exons that are changed during the nucleotides journey to becoming a functional protein. In this experiment we compared a nucleotide sequence into the NCBI's BLASTN database. We compared the results cross various species. Our sequence matches suggest that these specific sequences of nucleotides are present in many different species however their protein function varies. It suggests that over the course of evolution genes can change in functionality depending on species as well as environment. Some genes have remained the same over millions of years due to the lack of evolutionary pressure.

Finding your DNA Fingerprint

Presenter: Ted Pierre-Louis
Faculty Mentor: Dr. Nidhi Gadura
Department of Biological Sciences and Geology

Abstract:

Did you ever wonder if there is another version of you in the world? DNA fingerprinting can answer that. No two individuals except your identical twin can have the same fingerprint. DNA fingerprinting is the analysis of DNA from samples of body tissues or fluids in order to identify individuals. For our experiment, we extracted our genomic DNA from our cheek cell to see if we are homozygous +/+ or -/- or heterozygous +/- for ALU element on our chromosome 16 locus 92. An ALU element is a short stretch of DNA originally characterized by the action of the ALU restriction endonuclease. We hypothesize that students from different parts of the world might have similar patterns of ALU inheritance. Polymerase chain reaction was done to amplify the region of choice followed by gel electrophoresis. The results were analyzed for a group of 15 individuals and will be presented.
**pGLO Transformation**

**Presenter:** Mercedes Polanco  
**Faculty Mentor:** Dr. Nidhi Gadura  
**Department of Biological Sciences and Geology**

**Abstract:**

We have organisms with favorable traits that can be used as a tool in biotechnology. One such trait that is used as a tool is Green Fluorescent protein (GFP) originally found in jellyfish. Using vectors we are able to insert foreign pieces of DNA that can be fused with GFP so that it becomes a reporter gene. We can then control the expression of these genes with the help of inducers. In our experiment arabinose is an inducer and we are trying to control the expression of GFP gene in bacteria. Our hypothesis is that one in the presence of arabinose our transformed bacteria will glow green under UV light. The experiment was performed under conditions with arabinose and without and results will be shown.

**ELISA: Using Primary and Secondary Antibodies for Diagnosis and Detection of Diseases**

**Presenter:** Daysi Proano  
**Faculty Mentor:** Dr. Nidhi Gadura  
**Department of Biological Sciences and Geology**

**Abstract:**

ELISA (Enzyme-Linked ImmunoSorbent Assay) is a test that detects if antibodies are in the blood after being exposed to a disease. ELISA test are widely used to identify substances that have antigentic properties. Antigens are molecules that cause a prompt response in the immune system called antibodies. The antibodies that recognize antigens disease agents are called primary antibodies. The secondary antibodies, from different species, recognize and bind to primary antibodies. In this project, secondary antibodies are the conjugate enzymes (HRP) that produce a blue color in the presence of its substrate (TMB). If primary antibody is present in the serum sample, the wells turn blue and it is a positive diagnosis. If the wells remain colorless, the primary antibodies are not present in the serum samples and the diagnosis is negative. Details about quantitative ELISA: concentration controls, and experimental ELISA with unknown patient samples will be explained in the presentation.
What are GMO’s and How Can We Uncover Them?

Presenter: Aristeo Quiroz
Faculty Mentor: Dr. Nidhi Gadura
Department of Biological Sciences and Geology

Abstract:

Throughout history humankind has been selecting organisms that have specific qualities through selective breeding. Now, Genetically Modified Organisms (GMO’s) can create the organism we desire. Where once a plant would not have been able to withstand a hostile environment we can now force it flourish. As consumers in this society we often misunderstand food labeling and if genetically modified is the same as organic. In this experiment, we are able to identify GMOs by extracting genomic DNA from them, followed by PCR amplification of specific promoter regions CaMV 35S, the NOS terminator and/ or the chloroplast gene. We hypothesize that most food labeled organic should also be GMO free. We will show results from gel electrophoresis for all different foods tested. This will reveal the truth in food labeling and clear up any misconceptions about GMOs, organic and regular food we consume.

Purification of Green Fluorescent Protein by Hydrophobic Interaction Chromatography

Presenter: Silvia Salamone
Faculty Mentor: Dr. Nidhi Gadura
Department of Biological Sciences and Geology

Abstract:

Bacteria containing the pGLO plasmid are equipped with the GFP gene as well as the BLA gene which provides the bacteria with resistance to the antibiotic, ampicillin. Expression of the GFP gene can easily be regulated by the arabinose promoter. Arabinose will turn on the dominant GFP gene, resulting into a fluorescent green liquid culture. The presence of the GFP gene in the bacteria was also tested by isolating it through centrifugation, resuspension in TE buffer and purification. Chromatography represents a powerful technique for separating proteins in a complex mixture. A matrix that has an affinity for the molecule of interest was used. Since GFP has several stretches of hydrophobic amino acids, it will stick to the hydrophobic interaction chromatography (HIC) beads when passed over a HIC column. When the supernatant has completely entered the column, a green ring of fluorescence should be visible when viewed with UV light. Results of the experiment after using binding buffer, wash buffer and elution buffer will be presented.
**GFP Chromatography Abstract**

**Presenter:** Jason-Craig Thompson  
**Faculty Mentor:** Dr. Nidhi Gadura  
**Department of Biological Sciences and Geology**

**Abstract:**

Green Florescent Protein Chromatography involves the using a GFP reporter gene product to purify protein of your choice. In this experiment, we used pGLO plasmid to accomplish that. Chromatography is a procedure in which a particular protein is purified from a whole cell lysate. GFP is extremely hydrophobic compared to bacterial proteins. Unique characteristics of GFP enable its purification from bacterial cell-proteins using HIC columns. We take advantage of the fact that at certain salt concentrations, the hydrophobic regions of GFP protein are exposed and bind to the column. We hypothesize that when we change these salt concentrations, we can then release our GFP protein and purify that fraction. The GFP was synthesized by transformed bacteria, we then lose the cells, added the lysate under high salt conditions to the Chromatography column then changed the conditions to release the protein from the column and collect the protein fraction that fluoresces green under UV light.

**Genetically Modified Organisms**

**Presenter:** Smaragdi Tsourapa  
**Faculty Mentor:** Dr. Nidhi Gadura  
**Department of Biological Sciences and Geology**

**Abstract:**

Genetically modified organism is a living organism that has been modified using genetic engineering techniques. Specific genes are targeted to be able to manipulate the plant production. Plants are attractive to targets for genetic modification due to commercial importance. Genes can be randomly inserted into the plant genome using the Ti plasmid. We hypothesize that out of random food samples we tested, certified organic food should be GMO free. We extracted genomic DNA from plants then did PCR amplification targeting most commonly used GMO markers. We then did Gel Electrophoresis to see our results. Results tested from various everyday food items will be discussed.
Utilizing LacZ Blue-White Colony Screening strategy

Presenter: Maria Virginia Villadiego-Punto
Faculty Mentor: Dr. Nidhi Gadura
Department of Biological Sciences and Geology

Abstract:

Cloning vector pBR322 and pUC19 will be used in this experiment for subcloning. The insert was amplified using PCR from pBR322 and run on a gel to confirm the size. The insert was cut using restriction enzymes EcoRI and HindIII which created different sticky ends in both the insert and pUC19 MCS site within the lacZ gene. We hypothesize that if the insert ligated with the vector, then that would disrupt lacZ gene which will lead to white color bacterial colonies. However, if the vector closed without will be blue because lacZ gene will still be intact and can cleave XGal on the plate to create blue precipitate. Results showed that there were more blue colonies (re-annealed vectors) formed on vector control medium without the insert and few white colonies on ligation reaction (recombinant vectors), indicating successfully modified intake of foreign DNA.

Stress and Heart Disease

Presenter: Wanling Wang
Faculty Mentor: Dr. Mohammad Javdan
Department of Biological Sciences and Geology

Abstract:

I learned about heart’s functions by taking Bio302 (A&P) which made me interested in cardiac diseases. Heart diseases are the top reasons of death around the world and number one reason of death in the United States. Coronary heart disease is the most common type of heart disease, killing nearly 380,000 people annually. Several factors like high level of cholesterol in blood stream or high blood pressure causes Coronary heart diseases, it is known that any type of stress causes high blood pressure. The results, which were presented at an American Heart Association meeting in 2010, also showed that women who worry about losing their jobs are more likely to have high blood pressure and unhealthy cholesterol levels. By doing this research paper I was able to acquire and extensive knowledge about the structure and function of heart risk factors and symptoms of heart diseases.
pGLO Transformation

Presenter: Oscar J. Zagalo
Faculty Mentor: Dr. Nidhi Gadura
Department of Biological Sciences and Geology

Abstract:

Plasmids are small circular pieces of DNA containing genes that can be expressed when needed. For this experiment the pGLO plasmid has been genetically engineered to carry the GFP gene. The expression of this gene can be controlled by arabinose sugar. The source of the GFP gene is the bioluminescent jellyfish Aequorea victoria, which causes the jellyfish to fluoresce and glow in the dark. We hypothesize that the transformed bacteria will produce the fluorescent protein only in the presence of arabinose causing them to glow a green color under ultraviolet light. The procedure for this transformation involves the use of a transformation solution containing CaCl₂ in order to insert the pGLO plasmid through the cell membrane. The transformed cells will be selected on an ampicillin medium and the gene expression tested on plates with and without arabinose. Only the plates with arabinose expressed the GFP gene.
Mobile Autonomous Robot Utilizing an Arduino Programmed as a Controller

Presenters: Faraud Ibrahim, Lianghua Jiang, Rahmin Mishailov, Collins Peprah, Christine Grace Villanueva

Faculty Mentor: John Buoncora

Department of Engineering Technology

Abstract:

The mobile autonomous robot utilizes the Arduino electronic prototyping platform as a controller, which is programmed in the C language. Differential drive steering is implemented by applying pulse width modulated signals to the individual motor driver circuits. Infrared and ultrasonic sonar based ranging sensors indicate the distance between the robot and objects to be avoided. The developed program reads the ranging data, makes decisions based on the data, and provides output commands to control the motors.

The Arduino microcontroller signals are applied to the H-Bridge driver circuits, which cause the motors to rotate at speeds that depend on the average voltages applied to the motors and the load torques. Infrared sensors provide analog output voltages that are a function of the distance to an object. These analog voltages are applied to an analog-to-digital converter in the Arduino microcontroller. The ultrasonic sonar based sensor provides a digital pulse output, possessing a width that equals the time of flight of the sound wave.

The control program reads the sensor data and determines the left and right motor wheel velocities required to move the robot in a straight or curved path. The radius of the curved path is a function of the left and right wheel velocities and the wheel base of the robot. The program is designed such that the robot will move straight ahead until it detects an obstacle, at which point the robot will stop, move back, and then rotate in order to avoid the obstacle.

Programing of a DC Motor using Assembly Language

Presenter: Lianghua Jiang

Faculty Mentor: Professor Hamid Namdar

Department of Engineering Technology

Abstract:

In this project, the student will write a program to demonstrate the control of a DC motor using an 8086 microprocessor. The student will write the code in assembly language to move the motor in several ways. That includes rotating it clockwise and counter-clockwise for several revolutions. Student will show the design of the program using flowcharts, code, run and troubleshooting of the program and also demonstrate the final result.
8086 Assembler for Windows

Presenter: Lianghua Jiang
Faculty Mentor: Professor Hamid Namdar
Department of Engineering Technology

Abstract:

In this project, the student will demonstrate the procedure of using the Cross-ware Embedded Development Studio for Windows. This integrated development tools has multiple tool chains, simulators and debuggers and provides editing, browsing of programs in assembly language. The student will show how to create a new project for an 8086 microprocessor and write an assembly program which will count in binary number and display it on the LEDs in the application board. The presenter will assemble and link the program and show the output.

Word Perception Game

Presenter: Franklin Mejia
Faculty Mentor: Dr. Merlinda Drini
Department of Engineering Technology

Abstract:

I have designed a computer program which is developed as a word game with certain features. The key word in the program will appear and then disappear. The amount of time that the key word appears on the screen must decrease if the user gets a correct answer. The amount of time that the key word appears on the screen must increase if the user gets an incorrect answer. - The entire key word must appear on the screen, even if it is long. When the key word disappears, the three choice words must appear. The current question number must be displayed while the program is running. There must be an immediate indication of whether or not the user’s choice was correct. The user will get directions for how to use the program before the word perception test starts running. The directions include the number of questions in the game. The game keeps a score, so it is being clear in the directions how that score is derived.
Special Thanks to:

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