

# Schedule of Events

1:00 – 1:05

Welcome & Opening Remarks

Dr. Patricia Dwyer

Vice President for Academic Affairs of Wesley College

1:05 – 1:55

Performances: Session I

2:00 – 2:40

Oral Presentations: Session II

Poster Presentations & Photography Display

2:45 – 3:25

Oral Presentations: Session III

3:30 – 4:10

Oral Presentations: Session IV

4:15 – 4:45

Reception & Ceremony

Oral Presentations and Performances in Wells Theater,  
Cannon 7, and Slaybaugh 104

Poster Presentations & Photography Display  
College Center Lobby & DuPont Gallery

Reception & Ceremony in College Center 206

**Performances: Session I**

1:05 – 1:55

**Wells Theater**

**Moderator: David Laganella**

*Wesley Choir*

James Wilson, Conductor

*Contemporary Band*

David Laganella

**Oral Presentations: Session II**

2:00 – 2:40

**Panel 1: Wells Theater**

**Moderator: Victor Greto**

*The Importance of New Age Music  
in the Curing of Nature Deficit Disorder*

Jennifer DeVore and Lauren DeVore

*Existentialism, Nihilism, and American Media*

David Rogers and Tanner Polce

**Panel 2: Slaybaugh 104**

**Moderator: William Kroen**

*Athletic Participation and its Time Commitment  
as it Pertains to Academic Progress*

Erich Gillespie and Timothy Putman

*Body Image and Academic Performance, a Comparative Study*

Katrina Schmit

**Panel 3: Cannon 7**  
**Moderator: Colleen DiRaddo**

*Perception of Cleanliness of Facilities  
and Overall Consumer Experience*  
Shane McSweeney

*Relationship of High School Budget Challenges  
and Athletic Director Performance*  
Aaron Benson

**DuPont Gallery**  
**Photography Display**

**College Center Lobby & DuPont Gallery**  
**Poster Presentations**

*A Feasibility Study of Geothermal Energy across the United States of America*  
Lisa Antonelli and Eric Lira

*Sustainability: Are We Getting Squeezed out of Existence?*  
Eric Czerwinski

*Importance of Solvolysis*  
Jasbir Deol, Catherine Gross, and Kaylee Miller

*Creation of an online freely-accessible cancer drug database*  
Melissa Earley

*Analysis of nucleophilic substitution in substituted phenyl chloroformates*  
Gabriel Fernandez

*Feasibility study of Solar Energy at Wesley College*  
Kyle Frame and Larry Meade

*Community Involvement and Elementary Chemistry Education*  
Kyle Gillespie

*Detecting Estrogens in Chicken Waste*  
Aaron Givens

*Perceptions which Differentiate Successful from Struggling Students*

Khawaja Hameed  
*Does attempting to directly inspire self-efficacy play a role  
in a student's ability to learn math?*

Khawaja Hameed

*Understanding the fragmentation of 0-p tolyl chlorothionoformate  
in a variety of organic solvents*

Olivia Hampton

*Evaluating the solvolytic mechanism of crotyl chloride*

Ashley Harmon and Annie O'Connor

*A Water Quality Assessment of Nontidal Streams in the Sassafras River Watershed*

Taylor Hendricks

*Stressors of Married Mothers and Single Mothers*

Ashley Maser

*Evaluation of Course Performance by Meeting Time*

Margaret Murtagh and Adam McGuire

*Birth Order & Relationships: Affiliation and Attraction*

Brian McNemar

*Analysis of the Genetic Variance of Streptococcus mutans*

Annie O'Connor

*Solvolytic study of an acyl chloride using fast kinetics*

Annie O'Connor

*Music's Impact on Severe Dementia: A Meta-Analysis*

Danielle Richey

*Correlation of the rates of solvolysis of 4-chlorophenyl chlorothionoformate*

Brett Sansbury

*Experiential Learning Through Environmental Outreach:*

*An Undergraduate Student Perspective*

Melissa Savin

*Analysis Of The Difference Between Perceived and Actual Performance  
in Developmental Math Courses at Wesley College*

Kasey Thompson

*The Demographics Behind the Vote*

Taylor Trapp

**Oral Presentations: Session III**

2:45 – 3:25

**Panel 1: Wells Theater**  
**Moderator: Brantley Craig**

*Rehoboth Beach Independent Film Society*  
Trevor Kling, Jeffrey Kreston, and Michael Porter

*The Responsibility Party*  
Katrina Schmit

*The Reach of the School Board, the Highlight of Public Administrative Policy*  
Tanner Polce

**Panel 2: Slaybaugh 104**  
**Moderator: Frank Fiedler**

*The Consequences of Reality TV*  
Jeremy Harper

*Differences of Perception in Negative Characteristics  
of Television Characters and Real People*  
David Rogers

*Arts in the Parlor*

**Panel 3: Cannon 7**  
**Moderator: Yu Tian**

*Assessments and Careers in Mathematics*  
Steven Scott Cook

*Bigger May Not Be Better: An Analysis of the Warehouse Club Industry*  
Jennifer Wojciechowski, Emily Wood, and Cory Mitchem

## **Oral Presentations: Session IV**

3:30 – 4:10

### **Panel 1: Wells Theater Moderator: Tery Griffin**

*Recreational Vision*  
Antonio Gary

*R U Statistics Smart? Uses and Abuses of Statistics*  
Bethany Geckle, Asia Reed, Nicole Waweru and Jessica Wearden

*Ethical Dilemmas in Statistical Experiments*  
Ashley Montgomery and Gloria Ogunleye

### **Panel 2: Slaybaugh 104 Moderator: Jack Barnhardt**

*Robots are in Town*  
Azure Johnson

*Racial Preference Among International Children*  
Carllistus Obeng

*Gender and Sexual and Emotional Infidelity*  
Christopher Kady

### **Panel 3: Cannon 7 Moderator: Rebecca Benson**

*Fitness Training: Self Directed or Personal Trainer Directed*  
Aletta Tuthill

*Physical Therapy Success Determination – Factual or Opinionated*  
Farryn Kauffman

*Rehabilitation Effectiveness – Factors to Consider*  
Joshua Focht

## ***Feasibility Study of Geothermal Energy across the United States of America***

**Lisa Antonelli and Eric Lira**

**Mentors: Bruce Allison and Jeffrey Mask**

We live in a very wasteful world. To avoid compromising the ability of future generations to meet their needs, we must start thinking in terms of conservation and sustainable use. The best way to reduce our energy waste is to improve energy efficiency. This can be attained by implementing geothermal energy into our households. By using a more sustainable source of energy, we can reduce waste, reduce our ecological footprints, and potentially save money. Geothermal energy is thermal energy stored in the soil, underground rocks, and fluids in the earth's mantle. It provides a clean and renewable resource.

The goal of our research is to examine the feasibility of implementing geothermal technology into households across the country. We chose homes in four different regions of the country. The Northeast is represented by Hartford, Connecticut, the South by Baton Rouge, Louisiana, the West by Tonopah, Nevada, and the Midwest by Omaha, Nebraska. The homes all have the same characteristics to ensure an accurate measurement of where using geothermal energy is most feasible. We used an online estimator as our main tool, acting as a calculator. After each regional home was entered into the calculator and the values were compared, we were able to conclude which area would reap the most economic benefit the fastest.

We concluded that installing a geothermal system as a source of energy would be most economically beneficial in Omaha, Nebraska, as the cost of installing a geothermal system is recouped more quickly. This result may be due to the fact that this area endures the harshest winter season of them all, so it has an increased use on their heating systems. As the world's reliance on fossil fuels increases, there is a higher demand now, more than ever, to implement a more sustainable source of energy in our daily lives.

## ***Ethical Dilemmas in Statistical Experiments***

**Ashley Montgomery and Gloria Ogunleye**

**Mentor: Agashi Nwogbaga**

Statistical experiments help us study, understand and improve the world around us. Medical breakthroughs, success in business entrepreneurship, efficacy of military strategies, and development of wonderful instruments in the natural pursuit of happiness have all been aided by appropriate statistical experiments. In some experiments, the ethical line of decency is accidentally or flagrantly crossed as more harm than good is done. For instance, is a statistical experiment unethical if the best interests of the experimental subjects are neglected in favor of business profits or governmental goals? At what stage should an experiment be aborted? Is it ethical to use placebos? An allergy sufferer once stated that it was sheer wickedness for a researcher to give an allergy sufferer a placebo. "Give me the main stuff; if it works, I'll tell you; if it doesn't, I will tell; allergy sufferers are already going through hell battling the allergy; don't make fun of us by giving us placebos", she passionately argued. In this research work, ethical dilemmas in statistical experiments are investigated and analyzed.

## ***Assessments and Careers in Mathematics***

**Steven Scott Cook**

**Mentor: Agashi Nwogbaga**

People often wonder what they can do with a degree in mathematics or what one can do with knowledge of mathematics. In this project, we discuss types of companies, businesses, and government agencies that are looking for new employees that majored in mathematics and what specific math skills they expect them to have. We also look into companies looking for graduates with mathematical skills, not necessarily math degrees and suggest courses students should take to enhance their resume in today's job market. Finally, we analyze the assessments in mathematics using statistical procedures like hypothesis testing combined with correlation and regression.

## ***Sustainability: Are We Getting Squeezed out of Existence?***

**Eric Czerwinski**

**Mentors: Bruce Allison and Jeffrey Mask**

In the 21st century, the rapidly growing world human population is creating an adverse effect on biodiversity, natural resources and environmental quality that the Earth provides. Education is an important tool in changing popular opinion towards wasteful lifestyles. One way to inform the public is through art. This presentation is a visual artistic poster about the effect of human habitation on the Earth and the environment in which they live in. The artwork is intended to give the viewer a graphic view of the degradation of the environment as it is happening today. The image on the poster is that of a hand squeezing the Earth causing liquid to "leak" out of the bottom of Earth representing the loss of biodiversity, natural resources and environmental quality from unsustainable industrial, agricultural consumer practices. As a consequence, humans will be forced face a paradigm shift in the near future where modern conventional wisdom will change the definition of success from personal material wealth to success in a non-material state. These changes will include radical changes in the world economies, the rise of local, decentralized agriculture and the downsizing of energy requirements of new green technologies and lifestyles.

## ***Importance of Solvolysis***

**Jasbir Deol, Catherine Gross, and Kaylee Miller**

**Mentor: Malcolm D'Souza**

Solvolysis is a mechanism in which a nucleophilic solvent is used as a reactant to split a compound. Most of these reactions are substitution, however elimination and fragmentation reactions also occur when high temperature is present. Common forms of solvolysis are

hydrolysis and glycolysis. Solvolysis is important for the development of prescription drugs and agricultural research.

There are four types of solvolysis mechanisms: SN1, SN2, E1, and E2. One studies solvolysis in two ways. The first is through titration, the process in which one solution is added to another solution such that it reacts under conditions in which the added volume may be accurately measured. The second is through conductance using a kinet.

Studying solvolysis leads to a better understanding of the mechanisms by which reactions occur. Solvolysis is useful because once the reaction rates are known and the mechanism is understood, other compounds can be made from the original compound. Also, with regards to prescription drugs, with a known reaction rate and mechanism, the drug's reaction with the body can be understood.

The compound whose reaction rate is studied in this experiment is allyl chloroformate which is part of the family of chloroformates. Chloroformates are used as intermediates for the synthesis of pesticides, perfumes, drugs, foodstuffs, polymers, dyes, and other chemicals.

## ***The Importance of New Age Music in the Curing of Nature Deficit Disorder***

**Jennifer DeVore and Lauren DeVore**

**Mentors: Bruce Allison and Jeffrey Mask**

The issue of Nature Deficit Disorder is a rising problem in contemporary American society. In today's world of electronics and technology, it has become easy for individuals to become disconnected with the outdoors. However, a possible preventative measure has been created through the implementation of New Age music. In order to demonstrate the relationship between the amount of time spent outside and New Age music, we surveyed fifty Wesley College students. Shockingly, ten percent of students say they do not spend any time doing outdoor activity, with the average student only getting an hour of outdoor activity. Only a little over a quarter of the Wesley community was familiar with New Age music, and only two percent of the students surveyed actually listen to New Age music. This could possibly be because students are less able to relate to New Age music because of their own severed connection with the natural world. The objective of this project is to spread awareness about the growing prevalence of NDD, and how New Age music can be used as a therapeutic technique to prevent the onset of the disorder. Our hope is that through the New Age music we have written to perform, we are able to give a voice to nature and that people will see that New Age music is more than just a series of notes, but rather, the interpretation of something larger, beautiful and more important: the environment and its natural processes.

## ***Creation of an online freely-accessible cancer drug database***

**Melissa Earley**

**Mentors: Malcolm D'Souza**

Package inserts of Food and Drug Administration (FDA) approved prescription drugs, including chemotherapy drugs, must follow a specific format imposed by the FDA. These inserts are created by unrelated pharmaceutical companies and as a result tend to be very different in the way the required information is reported. In the previous project, various pharmacokinetic properties from 85 FDA cancer drug profiles were evaluated. A database that contains this information was created utilizing a commercially available software platform called the KnowItAll® Informatics System. However, the usage of the information from the database was heavily limited by the underlying platform.

Using the information from the KnowItAll® Informatics System as a starting point, a relational cancer drug database (MySQL) was created by a collaborative effort of researchers from Wesley College and the University of Delaware. The purpose of the project is to facilitate analysis and/or prediction of a chemotherapy compound's missing pharmacokinetic properties.

## ***Analysis of nucleophilic substitution in substituted phenyl chloroformates***

**Gabriel Fernandez**

**Mentor: Malcolm D'Souza**

Mono substituted phenyl chloroformate esters such as 2-methoxyphenyl chloroformate have found use in the preparation of symmetrical urea's that have patented herbicidal control applications against certain weeds, fungi, and bacteria. With the recent introduction of novel synthetic methodology, the interest in the synthetic utility of such and aryl esters is further enhanced due to their supplemental increased use in pharmaceutical formulations.

## ***Rehabilitation Effectiveness - Factors to Consider***

**Joshua Focht**

**Mentor: Barbara Abbot**

A business is composed of key parts that determine success or failure. These parts consist of the product produced, the packaging of the product, the distribution of the product, and the assembly of the product. A Physical Therapy clinic fits this business model. The health and recovery of the patient is the product, the packaging is the clinic itself, the distribution is how patients are referred to them and advertising, and the assembly is the methods the Physical Therapists use to get the results.

The healthcare profession is on the incline. With the population gradually aging and the fact that people will always face injury, specifically Physical Therapy is on the incline. This intern makes for steeper competition between clinics. Just as a grocery store will go out of business without customers so will a Physical therapy clinic. Knowing what will draw customers in and knowing what the consumer wants is vital to a PT clinic. This research project will outline what the patient wants when searching for a Physical Therapy clinic. Dover and the surrounding area has fifteen PT clinics. The data collected and results of the research will prove beneficial for this new company competing with other PT clinics.

### ***Feasibility Study of Solar Energy at Wesley College***

**Kyle Frame and Larry Meade**

**Mentors: Bruce Allison and Jeffrey Mask**

Thanks to advancements in modern technology, solar energy has become a more feasible form of alternative energy. By installing solar panels, we achieve two key points in preserving the environment. The first is a reduction in the carbon footprint of the school. The second is the usage of a clean alternative energy. The objective of this study is to determine the feasibility of installing solar panels at Wesley College, particularly on the roofs of the Malmberg and Zimmerman residence halls. In order to determine if the installation of solar panels is feasible, several factors must be analyzed. The total cost of and size of the system that would be installed needed to be determined. This includes the price of the solar panels, as well as the cost of installing these panels. The amount of total free space available to install the system was calculated. Height and orientation of the buildings need to be considered in order to obtain an optimal level of sunlight absorption, and the rooftops need to be free of anything that could potentially block sunlight. The amount of electrical energy that the college uses needs to be determined for any building that is going to have the solar panels installed, and this was approximated for both Malmberg and Zimmerman. Finally, eligibility for the aid of installing the panels via Federal state government aid needs to be done to see if installation is affordable. After conducting the study, we determined that while the installed panels will not provide all of the energy needed for these buildings, it would save the school approximately \$56,960 every year. The system would pay for itself in approximately 14-15 years and since the usable lifespan of a solar panel system is 35-40 years, it is feasible to install the panels on the rooftops.

### ***Recreational Vision***

**Antonio Gary**

**Mentor: Tery Griffin**

Recreational Vision is a Rap/Hip-Hop music blog created to provide quality music for both underground and mainstream music fans. The site provides daily updates on the latest songs, projects, and news. The site also has a series of features that consist of album reviews,

monthly downloadable playlists, and the promotion of upcoming artists. Even though the site focuses mostly on Rap/hip-hop, it contains posts on Electronic, Indie Rock, and other music genres. The site continues to be updated and has been active for over a year. Not only does Recreational Vision serve as a tool to help music fans and site visitors remain up to date on the latest music, but it also provides another outlet for upcoming artists to promote their music. The site is the foundation for the creation of a magazine company in the near future. Blogs have become an important factor in remaining relevant and knowledgeable in a variety of music genres. Recreational Vision serves as an appropriate example of how a simple blog can turn into a successful site through dedication, hard work, and innovative ideas.

### ***R U Statistics Smart? - Uses and Abuses of Statistics***

**Bethany Geckle, Asia Reed, Nicole Waweru, and Jessica Wearden**

**Mentor: Agashi Nwogbaga**

In our society today, everyone is constantly bombarded with statistical information from the television, internet, workplace, and just about anywhere. The statistical claims may be about political candidates, beauty products, health statistics, job prospects, student population and composition at a local university or college, or vehicular accident statistics. The allocation of vital resources (money, time, etc.) is often driven by these statistical claims. To make sense of the information that constantly comes our way, it will be helpful for many people if they are statistics smart whether math is their forte or not. We should all be aware of the laudable uses of statistics as well as the potential abuses of statistics. Ultimately, knowledge is power. In this work, we explore these uses and misuses of statistics, and most importantly, how to be statistics smart in our statistics-intensive and statistics-driven society.

### ***Athletic Participation and its Time Commitment as it Pertains to Academic Progress***

**Erich Gillespie and Timothy Putman**

**Mentor: Derald Wentzien**

Athletic participation has been a staple in American society, as well as our world's society, for a number of years and its affluence as a contributor to our culture is considerable. This study will examine the relationship between athletic participation and academic performance among athletes involved at Wesley College. An athlete's involvement in their sport intensifies in college where their intentions of success are constantly reinforced. Because of this, over time they may become progressively detached from their academics. A sports program's success should never be measured by victories alone, but by how effective the structure of said sports program coincides with the goals of the academic institution. Students have been given surveys and from this data we will be able to determine the time commitment various sports at the college demands, and to what degree the students feel that their athletic responsibilities have

affected, positively or negatively, their progress academically. In turn, these results may be able to advance a sports program to better suit the needs of a college student athlete.

### ***Community Involvement and Elementary Chemistry Education***

**Kyle Gillespie**

**Mentor: Malcolm D'Souza**

Our goal was to teach elementary school children about chemistry by demonstrating the relationship between household chemicals, their health, and their future. We attempted to accomplish this by nourishing and growing their curiosity in chemistry and science in general, in a fun and thought provoking way. This was done by using experiments that illustrated the differences between hydrophilic and hydrophobic substances and showing the participants how they are used in the environment. Also ultra violet light sensitive beads were used as a gateway to explain the harmful effects of ultra violet light on their skin and eyes. Undergraduates in the second semester of organic chemistry conducted all of the demonstrations to inspire and encourage the next generation to go into science, and this project also gave the participating undergraduates a chance to get involved in the local community.

### ***Detecting Estrogens in Chicken Waste***

**Aaron Givens**

**Mentor: Malcolm D'Souza**

The estrogen hormone at levels as low as parts per trillion can have antagonistic effects on animals and humans. These hormones are classified as endocrine disrupting compounds for their ability to cause hormonal imbalance. Chickens are known to excrete estrogen hormone into their waste and the concentration of the estrogens in the manure could be of great concern. The four known estrogens that chickens excrete,  $17\alpha$ -estradiol,  $17\beta$ -estradiol, estrone, and estriol, were detected by gas chromatography-mass spectroscopy at levels of parts per million in samples of fresh manure, compost manure, internal chicken house dust and external fan dust. The concentration levels of  $17\beta$ -estradiol and estrone stay prevalent in samples of compost manure making up 33.56, and 59.31% respectively compared to that of estriol which, appears to biodegrade rapidly over time making up only 1.19% of compost manure, and  $17\alpha$ -estradiol which, appears in low frequency to the  $17\beta$ -estradiol isomer making up 5.94%. The hormone concentrations found in the dust samples were lower than that of the fresh manure samples collected where the dust would originate. However, sufficient amounts of estrogenic hormone were detected in dust samples such as  $17\beta$ -estradiols (a known carcinogen) lowest concentration fan dust concentration of 0.076ppm. This project is supported by NIH-NIGMS-INBRE grant 2 P20 RR016472-12, NSF ARI R2 grant #: 0960503, NSF MRI grant # 0520492, NSF EPSCoR grant # EPS-0447610, and the DESGC Undergraduate Tuition Scholarship through the NASA funded Delaware Space Grant Consortium program (no. NNG05GO92H).

## ***Perceptions which Differentiate Successful from Struggling Students***

**Khawaja Hameed**

**Mentors: Derald Wentzien and Charlene Stephens**

As more and more students get accepted into various colleges, research continues as to how to help these students succeed. Freshmen are the main target in this study because freshman may need more guidance and direction adapting to college mentalities than other grade levels. This study aims to examine data, collected via an anonymous questionnaire, to determine if different perceptions helped a student succeed or struggle in a certain class.

## ***Does attempting to directly inspire self-efficacy play a role in a student's ability to learn math?***

**Khawaja Hameed**

**Mentors: Derald Wentzien and Charlene Stephens**

Self-confidence is a very important tool to have in many areas of life. This study aims to examine if directly trying to inspire self-confidence in students, via videos, will help increase a student's ability to learn math. The study includes a short quiz and questionnaire to collect data given to students after being shown the videos and being taught the lesson of the day.

## ***Understanding the fragmentation of 0-p tolyl chlorothionoformate in a variety of organic solvents***

**Olivia Hampton**

**Mentor: Malcolm D'Souza**

0-p tolyl chlorothionoformate is an important compound used in proteomic research. This research is concerned with protein arrays and their formations.

This project evaluates the reaction of 0-p tolyl chlorothionoformate in a variety of pure and aqueous organic solvents. The main goal of this research is to study the bond-making, bond-breaking processes that occur. This will be accomplished by an evaluation of the solvolytic rates using multiple regression analysis and the Grunwald-Winstein equation.

## ***Evaluating the solvolytic mechanism of crotyl chloride***

**Ashley Harmon and Annie O'Connor**

**Mentor: Malcolm D'Souza**

Crotyl chloride contains a pi bond and is used in the synthesis of homoallylic alcohols that are used in the creation of polyether antibiotics. These antibiotics are used in animal feed in the beef and dairy industry. Hence, it is important to understand the kinetics of crotyl chloride. This project analyzes the rates of solvolysis of crotyl chloride in several pure and aqueous organic mixtures of varying nucleophilicity and ionizing power. This analysis will determine if a unimolecular or bimolecular reaction is dominant.

## ***The Consequences of Reality TV***

**Jeremy Harper**

**Mentor: Victor Greto**

American Society has recently been attracted to the cultural phenomenon of reality television. Reality television is an assumedly unscripted, often dramatic situation with real people as opposed to professional actors. Many of the situations portrayed in reality television are often sensationalized by producers in the hope of garnering ratings. Like most of successful television, reality TV is popular because it provides a sensational version of everyday life; it provides an escape outlet for viewers; it provides an emotional release for viewers; and it showcases social problems. It is ultimately a commercialization of reality, one dependent upon ratings with no moral center.

## ***A Water Quality Assessment of Nontidal Streams in the Sassafras River Watershed***

**Taylor Hendricks**

**Mentor: Bruce Allison**

Recently, the Chesapeake Bay has been scrutinized for poor water quality, including high levels of nitrogen and phosphorus, large algae blooms, low levels of dissolved oxygen, and increased turbidity. Land use and land use practices often contribute to the nutrient and sediment loadings in the Bay. The effect of land use on potential nutrient loadings from a smaller sub-watershed can be determined through weekly monitoring. The Sassafras River watershed, a sub-watershed of the Chesapeake Bay on the Eastern shore of Maryland, was selected as a study site. The objective of this research was to evaluate water quality in non-tidal streams in the Sassafras River watershed. Historical data has been collected and reported by volunteers at several sites

throughout the watershed on a monthly basis for two years. This data was instrumental in determining six weekly measurement sites. The six sites chosen all had historically high nitrate concentrations for 9-12 months of the year. Additionally, phosphate concentrations at these sites were all at or above the local threshold for every measurement in the last two years. Weekly measurements of dissolved oxygen, phosphates, and nitrates, were completed in the six chosen streams. Monitored data showed that in 7 of the 9 sites, nitrate and phosphate concentrations exceeded threshold values at least 75% of the time. Historically, dissolved oxygen levels have not been a water quality issue. Only 2 of the 9 sites were consistently near threshold values. These high nutrient concentrations can be attributed, in part, to the surrounding land use. The project described was supported by Delaware EPSCoR, through National Science Foundation Grant EPS-0447610 and Wesley College.

### ***Robots are in Town***

**Azure Johnson**

**Mentor: Agashi Nwogbaga**

They are taking the lead in society: they are in homes, factories and laboratories. They work in several fields of labor. They are robots! Are we going to have students robots soon sent by rich families or international distant learners? Time shall tell. Although the robotics industry had not emerged until around the 1960's, there were traces of robotics dated centuries back. In 350 BC, Greek mathematician Archytas built a mechanical bird propelled by steam, known as "The Pigeon." Robot experiments and developments were introduced sporadically since that early period, but quickly multiplied after 1956 the first robot company (ROVer Ranch) was formed. As the time passed, and science and technology greatly improved, the robotics industry improved, too. Today, robots are easier to implement into society because of the advancement in Mathematics. Mathematics are vital to the robotics industry, because they are programmed to control every aspect of the robot, from vision to mobility. Physics, combinatorics and algorithms are just a few to name the mathematical topics used to program robots. If compared, robots from different scientists have one main thing in common: they have similar ideas and uses from different mathematics in their systems.

### ***Gender and Sexual and Emotional Infidelity***

**Christopher Kady**

**Mentor: Jack Barnhardt**

I will have handed out a survey measuring the reactions of males and females concerning hypothesized situations of emotional and sexual abuse. My hypothesis for this study is that men will be more jealous of and find it harder to forgive sexual infidelity while women will be more jealous of and find it harder to forgive emotional infidelity. Both sexes will display more anger,

disgust, and shock for sexual infidelity, but will display more hurt, blame for themselves, and overall negative emotion for emotional infidelity.

### ***Physical Therapy Success Determination - Factual or Opinionated***

**Farryn Kauffman**

**Mentor: Barbara Abbot**

This presentation will begin with a discussion about the newly forming relationship between graduates with a degree in Exercise Science and the Physical Therapy field. There is an upcoming trend for Exercise Physiologists to become an integral part of the clinical setting in Physical Therapy as well as other fields. I would like to introduce the audience to this new concept prior to discussing my research.

My research took place in the Physical Therapy setting. I aimed to study the correlation to how a patient feels they have progressed in comparison to their strength levels at the time of their discharge. I also analyzed the patients opinion of their functional analysis questionnaire that they took prior to starting their therapy and then again at the completion of their therapy. I believe that I will find a positive correlation between the strength improvements that the Physical Therapists measured and the patient's opinion of how they feel they are performing. Lastly, I examined the patient's opinion about physical therapy in general. I believe that there is a relation between how the patient feels about physical therapy and how they believe they are progressing. I believe that the more skeptical a patient is, the more likely they are to say they are not progressing well.

### ***Rehoboth Beach Independent Film Society***

**Trevor Kling, Jeffrey Kreston, and Michael Porter**

**Mentor: Yu Tian**

We completed marketing research on the Rehoboth Beach Independent Film Society in the fall of 2011. Our project discusses the surveys we created and distributed at the festival to members and non-members of the film society. These surveys asked questions such as demographics and feedback about the film festival. Once the surveys and the festival was completed, we organized the results in pie charts and provided feedback on changes we saw fit for the film society to make. We also covered background information about the Rehoboth Beach Independent Film Society and other festivals in the surrounding area.

## ***Stressors of Married Mothers and Single Mothers***

**Ashley Maser**

**Mentor: Jack Barnhardt**

My study is a study on the different stressors of single mothers and married mothers. I hypothesize that single mothers have a higher level of stress, but married mothers have a high level of stress with relationships. I am conducting this study for Experimental Psychology with Dr. Barnhardt. The study is being approved by IRB and I will be conducting it as soon as I get the approval.

## ***Evaluation of Course Performance by Meeting Time***

**Margaret Murtagh and Adam McGuire**

**Mentor: Mary Jo Benson**

Through statistical analysis, it is our objective to determine whether classroom attendance and overall performance is affected by meeting times. We plan to obtain our data from one specific professor, Ms. Laila Girgis, in order to minimize variables that may serve as outliers and distort our results. We will be accessing data from multiple MA108 (Math Operations and Concepts I) courses that were held during the morning hours for both the Monday, Wednesday, Friday and Tuesday, Thursday blocks during the Fall semester of 2011. While also looking at a student's class level such as; freshman, sophomore, junior, or senior, we want to conclude whether their performances differ on different days of the week. With conclusive results, we can determine what factors are causing students to perform worse on specific days, and address solutions to amend them.

## ***Birth Order & Relationships: Affiliation and Attraction***

**Brian McNemar**

**Mentor: Elizabeth Siemanowski**

Alfred Adler was a major contributor to personality theories during the early 1900s. One of his more well-known contributions was that of birth order as a major social influence and factor in personality development. While there has been much debate regarding the validity of Adler's theory, many studies have found statistically significant connections between birth order position and Adler's predictions. For instance, higher academic achievement is a tendency predicted to occur most often with first-born children. According to a meta-analysis by Eckstein, et al. (2010), multiple studies have found evidence to support this claim among others. Additionally Salmon's (2003) investigation revealed commonalities in sentiments and

interpersonal strategies regarding relationships between persons of similar birth orders. This finding raises the idea that birth order could be considered as a factor in social dynamics; which could then be applied to a multitude of social environments (e.g., classrooms, workplaces, etc.). We conducted a survey of 157 students of Wesley College which examined sentiments toward friends and romantic interests. Following the influence of Adler and other birth order researchers, the current study is designed to determine if birth order is a useful predictor of self-description (identity) and preferences in interpersonal relationships with close friends (affiliation) and romantic partners (attraction).

### ***Bigger May Not Be Better: An Analysis of the Warehouse Club Industry***

**Cory Mitchem, Jennifer Wojciechowski, and Emily Wood**

**Mentor: Kathleen Jacobs**

The warehouse club leaders, Costco and Sam's Club, should capitalize on the stores' low-cost strategies. Smaller warehouse clubs like BJ's Wholesale will become the leaders if the larger warehouse clubs do not simultaneously consider the needs of current customers while keeping costs low. No stores in the warehouse club industry should overlook the importance of providing good customer service. The warehouse clubs need to make customer preferences a number one priority. An analysis of the operating profit margins from 2008 to 2009 for Costco, Sam's Club, and BJ's Wholesale demonstrates the need for the leaders in the warehouse club industry to incorporate higher customer awareness into the companies' cost strategies. Costco's operating profit margin was 2.49 percent in 2009, which was a .23 percent decrease from 2008 to 2009. The operating profit margin for Sam's Club was 3.51 percent in 2009, which was a .21 percent decrease from 2008 to 2009. In contrast, the operating profit margin for BJ's Wholesale was 2.20 percent in 2009; however, it actually increased by .04 percent from 2008 to 2009. As a result, this demonstrates that the higher costs associated with good customer service have higher returns in the end.

### ***Racial Preference Among International Children***

**Carllistus Obeng**

**Mentors: Angela D'Antonio and Jessica James**

The pioneering study done by Kenneth and Mamie Clark was evolutionary, not only to the field of psychology, but also to the world. In 1940, the researchers became interested in racial preference in children. They tested 253 children using the help of dolls and interview questions. Overall the researchers found that more children showed preference to the white doll and in fact thought the black doll was inferior. This study has been replicated many times over the past 70 years, but there has been little study done in children outside the USA. In the purposed investigation children in Accra, Ghana, New Delhi, India, México City, México and Baghdad, Iraq would be included. These countries were chosen due to their economic growth and

independence. The researcher believes that there may be a higher level of Ethnocentrism in these countries and feeling of self-pride. The researcher hypothesizes that the child will choose the doll of their own race when subject to an interview which will include the statements “give me the doll that looks nice” and “give me the doll that you like to.

### ***Analysis of the Genetic Variance of Streptococcus mutans***

**Annie O'Connor**

**Mentor: Jon Kidd**

*Streptococcus mutans* is one of many species of bacteria found in the human oral cavity. While many of these species contribute to the phenomenon of dental caries, or the decay of tooth enamel, it has previously been shown that *S. mutans* contributes more than most other species, as it is able to produce large amounts of acid. The presence of a specific promoter gene, called mleR, has been cited as a factor for an increase in acid production by *S. mutans*, although not all strains of the bacteria possess the gene. In this study, eighty-nine saliva samples were collected from student participants ages 18 to 24. The DNA was then purified and a polymerase chain reaction (PCR) was performed on each sample. The amplified fragments, the mleR gene, were identified using gel electrophoresis. The presence or absence of the gene was then compared to acid production data from the same samples.

### ***Solvolytic study of an acyl chloride using fast kinetics***

**Annie O'Connor**

**Mentor: Malcolm D'Souza**

2-Thiopheneacetyl chloride is a compound with various uses in industry, including use as an intermediate for materials used in waste water remediation, as well as part of a patented protocol for the resolution of enantiomers in the pharmaceutical industry. Hence, it is imperative that the reaction of this compound in various binary organic-aqueous mixtures is fully understood. The extended Grunwald-Winstein equation is used to assess the effects of solvent variation on the specific rates of solvolysis of 2-thiopheneacetyl chloride. While previous publications have addressed the kinetics of 2-thiopheneacetyl chloride in various solvents, published data for the reaction of this compound using 1,1,1,3,3,3-hexafluoro-2-propanol (HFIP) as a solvent are unavailable. This solvent is especially useful in determining the kinetics of the reaction due to its ability to produce strong hydrogen bonds.

## ***The Reach of the School Board, the Highlight of Public Administrative Policy***

**Tanner Polce**

**Mentor: Alban Urbanas**

In September 2011 Colonel Richardson High School, located in Caroline County, Maryland, suspended seventeen of their football players due to "disorderly: conduct in a neighboring towns' Wal-Mart. All seventeen student athletes were wearing Colonel Richardson football uniforms at the time of the incident, which made the student athletes very easily identifiable. The suspension of the student athletes ultimately resulted in forfeiting the football home opener against their rivals, Cambridge-South Dorchester. The case, in itself, highlights the role of paternalism and the reach of a specific school district.

## ***Existentialism, Nihilism, and American Media***

**Tanner Polce and David Rogers**

**Mentor: Alban Urbanas**

The American Media maintains a strong presence throughout the world, so it's important to keep an eye on what messages are being spread about. This presentation will take a look at the themes of existentialism and nihilism which can be seen in many American television programs. The positions of existentialism and nihilism will be explained, and those ideas within each position will be connected to material in the television programs *It's Always Sunny in Philadelphia*, *Breaking Bad*, *Mad Men*, and *The Wire*.

## ***Music's Impact on Severe Dementia: A Meta-Analysis***

**Danielle Richey**

**Mentor: Nancy Rubino**

This project describes a meta-analysis of the effects of music therapy on agitation and anxiety, on individuals with severe dementia living in long-term care facilities. Patients with severe dementia have extreme anxiety, which leads to aggression. Although, these patients are treated with pharmacological methods, adverse effects of medications can put these individuals at risk for other serious issues. A literature review from 2001 to November 2010 was conducted using CINAHL, EBSCO Host, and Nursing Consult databases. Articles from journals in Taiwan, Sweden, Australia, and the United States of America were used. After application of the inclusion criteria, eight articles were selected. Four major themes were noted throughout the eight research studies. From these findings, results showed that music therapy does reduce anxiety and agitation in severely demented patients. It was noted, that individualized music had

the greatest impact on this population. Music was also found to increase appetite, decrease sundowning, and improve mood. Regardless of the research design, and culture of the subjects, music therapy had a positive effect. Including music therapy into care plans for older adults with dementia, could improve behavior issues among this population in the long-term care setting. Future research should be aimed at establishing the longevity of the effects of music, and the appropriate time of day to perform this therapeutic regimen.

***Differences of Perception in Negative Characteristics of  
Television Figures and Actual People***

**David Rogers**

**Mentor: Angela D'Antonio**

Many of today's popular figures in television seem to be completely lacking morality, yet they also maintain a high level of popularity. This presentation will cover psychological research focusing on likeability, illusory superiority, the construal level theory of psychological distance, and studies within the media that attempt to explain this phenomenon. A research proposal will also be covered that may shed more light on the matter.

***Correlation of the rates of solvolysis of 4-chlorophenyl chlorothionoformate***

**Brett Sansbury**

**Mentor: Malcolm D'Souza**

4-Chlorophenyl chlorothionoformate is used as a dealkylating agent for tertiary amines. Chlorothionoformates like 4-chlorophenyl chlorothionoformate have also found commercial uses such as fungicides and insect repellents. This project assesses its decomposition in various pure and aqueous organic mixtures by evaluating its solvolysis rates in solvents of varying nucleophilicity and ionizing power. Initial results suggest a dual mechanism that is heavily dependent of the ionizing ability of the solvent. This result will be further confirmed by comparing the rates of solvolysis of 4-chlorophenyl chlorothionoformate with the previously published rates of solvolysis of phenyl chlorothionoformate.

## ***Experiential Learning Through Environmental Outreach: An Undergraduate Student Perspective***

**Melissa Savin**

**Mentor: Bruce Allison**

Experiential learning is an independent, self-motivated, work-based cyclic learning process. An individual encounters experiences upon which perception and reflection occur. Ideas are conceptualized as probable solutions and implemented. Finally an evaluation of the effectiveness of the solutions occurs and are updated or modified as required. This learning process is preferred over classroom instruction because it allows the individual to take ownership and responsibility of the decisions made. The objective of this presentation was to summarize and exhibit the benefits of an internship experience guided by experiential learning. Over the past two years I have been part of a summer internship team. In the summer of 2010, we were involved in watershed science research with the Sassafras River Association (SRA) and we interacted with watershed volunteers. We were in charge of stream discharge calibrations, GIS work and stream water quality measurements. Summer 2011, I worked with the City of Dover, Office of Planning. I reviewed National Pollution Discharge Elimination System (NPDES) permitting and made recommendations to the city for public outreach. I created brochures and fact sheets on environmentally sustainable urban watersheds. I scheduled workshops and wrote a composting white paper. The information I compiled was made available to the public through publications and the Web. I created an environmental survey to distribute to the city's residents and uploaded a drip irrigation installation video on YouTube. My internship experiences have made me more aware and passionate about my future career in environmental studies. Through the utilization of the experiential learning process, I have been able to implement leadership skills, be creative, and make decisions that I am most confident will work in my areas of interest.

## ***The Responsibility Party***

**Katrina Schmit**

**Mentor: Cynthia Newton**

The Responsibility Party started out of disgust of the current society and culture in The United States; the wrong things are unavoidably idolized causing an unhealthy emphasis on toxic people, issues, events, and lifestyles. We feel the society of America has a particular burden of obligation to be responsible for our actions and ourselves. Our main focuses come out of the biggest effects in our society; garbage media, obesity, education, and personal responsibility. The definition of responsibility is "a duty or obligation to satisfactorily perform or complete a task (assigned by someone, or created by one's own promise or circumstances) that one must fulfill, and which has a consequent penalty for failure (businessdictionary.com, 2011)." Our party responds to any matter with this as a forefront. Slogan: "I am responsible."

***Body Image and Academic Performance, a comparative study***

**Katrina Schmit**

**Mentor: Jack Barnhardt**

This study looks at the relationships between body image and gender, grade point average, grade level, and number of hours of classes per week enrolled in and number of hours of classes per week attended of students at Wesley College. There are correlations made in previous studies between bad body image and psychological characteristics between the variables tested in this study, but they have not been clearly demonstrated. I believe that negative self-image results in significant mental health costs that affect academic performance and the number of hours attended per week in class, and that gender, specifically females, will have a significant correlation with body image.

***Analysis of the Difference Between Perceived and Actual Performance in Developmental Math Courses at Wesley College***

**Kasey Thompson**

**Mentors: Derald Wentzien and Paul Olsen**

In a previous study conducted in Spring 2011, a difference was found between MA 099 students perceived grade and the actual grade of the professor. They found that Wesley College students in MA 099 classes were judging their perceived grades falsely from their actual grades. In this follow-up study we wanted to identify the factors that affect students when studying the difference between the perceived and actual grades given by professors. A survey was administered to students in 2 sections of MA 099 and 6 sections of MA 101 in the middle of March. The students were asked to identify how successful they felt they were doing in the particular class, their actual grade at the given time, if they were ready to move onto a higher level math course and the factors that contributed to their success and attained them from being successful.

***The Demographics Behind the Vote***

**Taylor Trapp**

**Mentor: Bruce Allison**

This research involves looking at how people within the United States vote and why they vote in their desired way. Demographics of the voters can have more influence on the outcome of an election than just the voters' political affiliations. The purpose of this project is to show how more than just political aspects go into the voting mind of the people such as but not limited to: one's location, racial background, economic background and one's sex. The election results

in question will range from the major 2000-2008 elections. Much of the research data became accessible to us through ArcGIS version 9.3.1. and through scholarly web sources such as the United States Government's national atlas website. This will allow us to get a good grasp on what modern life affairs affect the voters the greatest. The queries in question revealed demographic age, income, race and locational profiles that explain in part the outcomes for the presidential elections in 2000, 2004 and 2008. Through this case study it was observed that one's political party of choice can be affected either mindfully and/or unmindfully by one's income, race, sex and regional location.

**Mentors**

Barbara Abbot  
Bruce Allison  
Jack Barnhardt  
Angela D'Antonio  
Malcolm D'Souza  
Victor Greto  
Tery Griffin  
Kathleen Jacobs  
Jessica James  
Jon Kidd  
David Laganella  
Jeffrey Mask  
Cynthia Newton  
Agashi Nwogbaga  
Paul Olsen  
Nancy Rubino  
Elizabeth Siemanowski  
Charlene Stephens  
Yu Tian  
Alban Urbanas  
Derald Wentzien  
James Wilson

**Scholars Day Committee**

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